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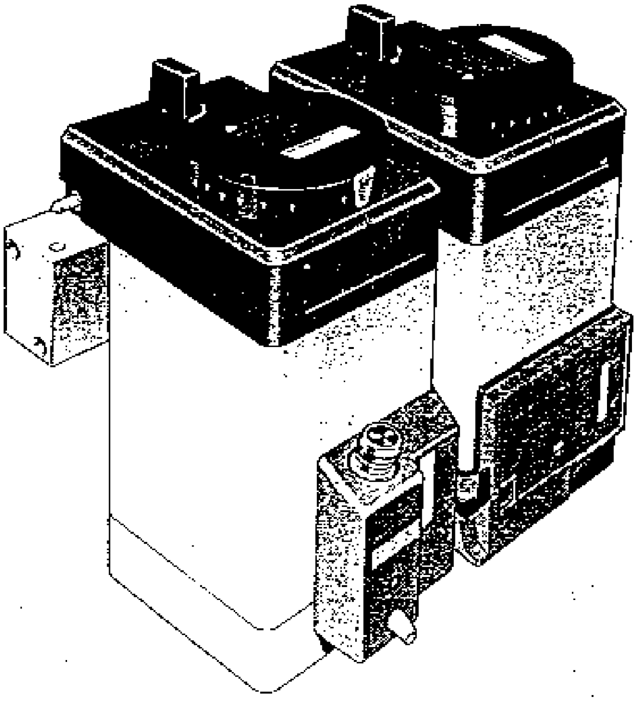
Tec 5 Continuous Flow Vaporizer

Service Centre Manual
(Vaporizers From Serial No. U04000 And Above)



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Restricted Procedure

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Tec 5 Vaporizer

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This Restricted Procedure extends permission to all Service Centres to fit two thermostat cover gaskets Part No. 1105-3118-00 instead of the stipulated one gasket when fitting the thermostat cover Part No 1105-3104-000.

Permission to fit two gaskets instead of one is an interim procedure which is only valid until the end of December 1995

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(Vaporizers From Serial No. 004000 And Above)

Service Centre Manual

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Section 1.0

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1.1 General

This manual is issued only to Ohmeda Authorised Service Centres on the basis of one manual for each Service Centre.

There are two versions of the Tec 5 vaporizer. One is designated an Original Version and one is designated an Enhanced Capture Volume (ECV) Version (see illustration Section3 page 2)

Service of the following ECV Vaporizers will be undertaken.

Serial No:	BCZU 04000 and above
Serial No:	BCYU 04000 and above
Serial No:	BCXU 04000 and above
Serial No:	BDCU 04000 and above

The manual is subject to revision by means of Letters of Transmittal which include instructions for the removal of old pages and the insertion of new pages. Each Service Centre is responsible for ensuring that the manual is amended in accordance with each Letter of Transmittal

The Manual is subject to audit by Ohmeda.

1.2 Precautions

A number of Warnings and Cautions are used throughout this manual to draw attention to the possible hazards and/or adverse conditions which may occur if the information and instructions provided are not strictly observed.

Warnings are preceded by a △ symbol and are used to draw attention to a condition which can endanger either the patient or the operator.

Cautions are preceded by a ⚠ symbol and are used to draw attention to a condition which can result in damage to the equipment.

Special attention must be paid to each Warning and Caution as it appears in the manual

1.3 Servicing Policy

Servicing and/or Repair procedures for this Product must be performed in accordance with written instructions provided by Ohmeda

Servicing and/or Repair procedures for this Product must be performed by personnel trained and authorised by an Ohmeda Service Centre Technical Authority to service and/or repair this type of equipment.

△ **Warning: An improper service and/or repair could result in patient injury.**

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Section 2.0

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2.1 General

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Each vaporizer is agent specific and is clearly labelled with the name of the anaesthetic agent for which it is designed and calibrated.

Refer to the Operation and Maintenance Manual for a detailed description and operating procedures.

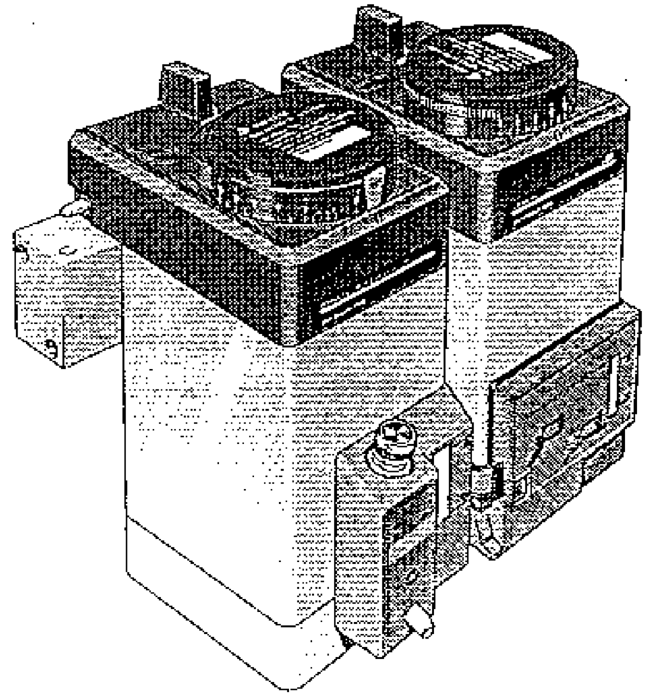

Fig. 2.1 Tec 5 Vaporizers

2.2 Interlock Mechanism

The Tec 5 vaporizer and series manifold comprise an interlock system which functions as follows:

1. Requires that the vaporizer is locked onto the manifold before the dial can be turned ON.
2. Helps to ensure that only one vaporizer at a time can be turned ON.
3. Helps to ensure that the gas flow enters only the vaporizer that is turned ON.
4. Minimises any unwanted trace vapour when the vaporizer is turned OFF.

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2.3 Control Dial

A single control dial with a concentration scale calibrated in % of anaesthetic agent vapour per total volume (v/v) is used to set the desired concentration of the anaesthetic agent.

[illegible] necessary to pull in the dial release and simultaneously rotate the dial counter-clockwise.

2.4 Rotary valve

Flow through the vaporizing chamber is determined by the position of the rotary valve which has a curved vapour control channel machined into its surface.

2.5 Thermostat

The thermostat is located on the underside of the sump assembly and is part of the sump assembly.

2.6 Sump Assembly

The sump assembly comprises a vaporizing chamber which stores the liquid anaesthetic and also acts as an evaporator for the stored anaesthetic.

It is designed to enrich the gas entering the sump to its saturation level at all flows and temperatures to ensure that the vaporizer performance remains in tolerance.

The enrichment effect is achieved by passing the gas stream over large areas of wick soaked with liquid anaesthetic.

2.7 Filling System

2.7.1 Keyed Filler

The keyed filler is a dual action system which consists of a single port filling and draining unit fitted to the vaporizer sump, and an associated agent level indicator.

2.7.2 Screw Cap Filler

The screw cap filler consists of a block assembly, filler cap, drain plug and an associated agent level indicator.

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3.1 Preliminary

3.1.1 Introduction

There are two versions of the Tec 5 vaporizer. One is designated an Original Version and one is designated an Enhanced Capture Volume (ECV) Version (see illustration on Page 2).

ECV Vaporizers have Serial Nos. in the following range:

BCZU 04000 and above
BCYU 04000 and above
BCXU 04000 and above
BDCU 04000 and above

This Service Centre Manual Part No. 1105-0119-000 only provides the information required to Service an Enhanced Capture Volume (ECV) Version.

There are two types of Enhanced Capture Volume Version Tec 5 vaporizer. One type incorporates a screw cap filler and the other incorporates a keyed filler.

⚠ **Warning: This manual and all its associated documentation must be studied thoroughly before any attempt is made to set up, operate, maintain or service any part of the Tec 5 Vaporizer. Failure to do so may result in patient injury.**

⚠ **Warning: Handle the vaporizer with care and if it contains anaesthetic agent keep the vaporizer upright.**

⚠ **Warning: Do not carry the vaporizer by the control dial. Use two hands to grasp the vaporizer body.**

⚠ **Warning: Unscrew the filler plug slowly to release any pressure in the vaporizer.**

⚠ **Warning: The vaporizer must only be serviced by technicians fully trained and authorised by Ohmeda.**

⚠ **Caution: Do not use force to remove the vaporizer from the manifold.**

⚠ **Caution: Turn the Vaporizer dial to OFF when it is not in use.**

The vaporizer is designed to be serviced at three year intervals, unless other problems/complaints arise which make it necessary to return it to a Service Centre.

The standard service procedure consists of the following.

1. Inspection for damage and wear.
2. Fitting new wicks, seals and updated components.
3. Lubrication and Tests
4. Checking the output concentration under closely defined conditions at different temperatures and flows and regraduation or adjustment as necessary.

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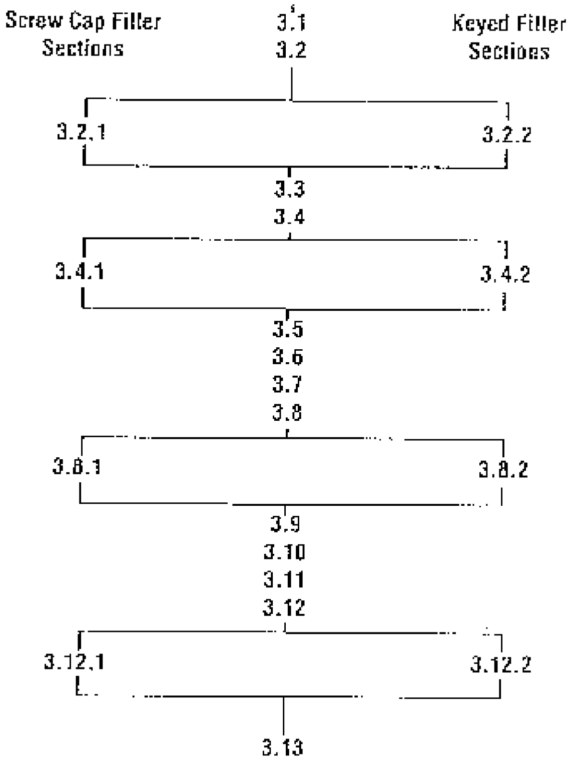
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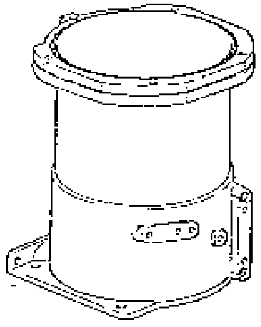
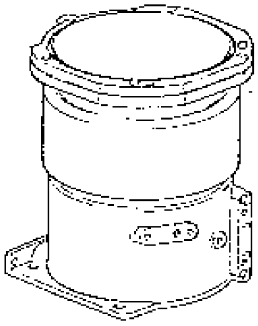
Note: The differences between a Tec 5 screw cap filler vaporizer and a Tec 5 keyed filler vaporizer are self evident, but the differences between an Original version and an ECV version of each type cannot be determined until the wraps are removed as described in Section 3.2.1 for the screw cap filler and Section 3.2.2 for the keyed filler. The two versions have different sumps as shown below.



Original Version Sump



Enhanced Capture Volume (ECV) Sump

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3.1.3 Special Tools - In Addition To Standard Tool Package Part No. 84200

Part No.	Description
2802-8001-000	Punch for Spindle Bush to Interlock Block
2802-8002-000	Tool for Fitting Seal to Screw Cap Filler
2802-8003-000	Torque Wrench for Actuator Spindle
2802-8004-000	Thermostat Setting Fixture
2802-8005-000	Halothane Thermostat Effective Length Setting Gauge
2802-8006-000	Enflurane and Isoflurane Thermostat Effective Length Setting Gauge
2802-8007-000	Hinge Strip to Flapper Alignment Fixture
2802-8008-000	0.5 mm Thermostat Setting Shim
2802-8009-000	Levelling Plate for Capacity Check
2802-8010-000	Screw Cap Filler Drain Adaptor
2802-8011-000	Keyed Filler Assembly Fixture
2802-8012-000	Retaining Screw Removal Tool
2802-8013-000	Mandrel for Quad ring Seal
2802-8014-000	Bottle Adaptor Gauge
2802-8015-000	Adaptor for Torque Driver (Sump and Spinning Assembly)
2802-8016-000	Keyed Filler Assembly Leak Test Fixture
2802-8017-000	Keyed Filler Bridge Setting Block (Halothane and Enflurane)
2802-8018-000	Keyed Filler Bridge Setting Block (Isoflurane)
2802-8019-000	Keyed Filler Bridge Setting Block (Sevoflurane)
2802-8020-000	Testing Top Plate for Leak Identification
2802-8021-000	Clamp Screw Securing Tool
2802-8022-000	Halothane and Isoflurane Reference Plate
2802-8023-000	Enflurane and Sevoflurane Reference Plate
2802-8024-000	Stop Moulding Cutting Tool
2802-8025-000	Stop Moulding Fitting Tool
2802-8026-000	Stop Moulding Removal Tool
2802-8027-000	Bell Crank Actuator (for Leak Testing)
2802-8028-000	Thermostat Stability Tool
2802-8044-000	Drain Plug Circlip Applicator
2802-8045-000	Interlock Circlip Applicator
2802-8046-000	2.0 mm A/F Allen Key Inserts
2802-8047-000	2.5 mm A/F Allen Key Inserts
2802-8048-000	3.0 mm A/F Allen Key Inserts
2802-8049-000	Vaporizer Base Support
2802-8050-000	Anti-tamper compound (Shellac)
2802-8051-000	Torque Tool, Standard, Set to 0.6 Nm
2802-8052-000	Torque Tool, Standard, Set to 1.0 Nm
2803-8053-000	Torque Tool, Standard, Set to 2.0 Nm
2802-8054-000	Torque Tool, Standard, Set to 2.6 Nm
2802-8055-000	0 to 25 litres Flowmeter
2802-8056-000	0 to 500 cc Flowmeter
2802-8057-000	Ball Ended Allen Key 2.5 mm
2802-8058-000	Ball Ended Allen Key 3.0 mm
2802-80[illegible]	[illegible]

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3.1.4 Dry Out Procedure - Both Fillers

1. Mount the vaporizer on stand Part No. 60920 and turn the vaporizer dial to its maximum setting.

2. Pass an air supply of 15 litres/minute through the vaporizer for a minimum of two hours or until the wicks have dried out, exhausting to a gas scavenging system. Alternatively, occlude the outlet from the vaporizer and use a vacuum equivalent to 5 litres/minute of negative flow fitted to the opened filter drain.

3. Remove the vaporizer from the stand and continue the disassembly procedure with either Section 3.2.1 Screw Cap Filler or Section 3.2.2 Keyed Filler as appropriate.

3.2 Disassembly - Labels And Covers

Note: Any vaporizers with a front label incorporating the old style Ohmeda logo (⸺) must have the label replaced with one which incorporates the new Ohmeda logo (OHMEDA). The new front label may remain in place at subsequent service unless it is defaced or damaged.

3.2.1 Screw Cap Filler (Figs. 3.1 and 3.2)

1. Remove and dispose of the dial label (1).

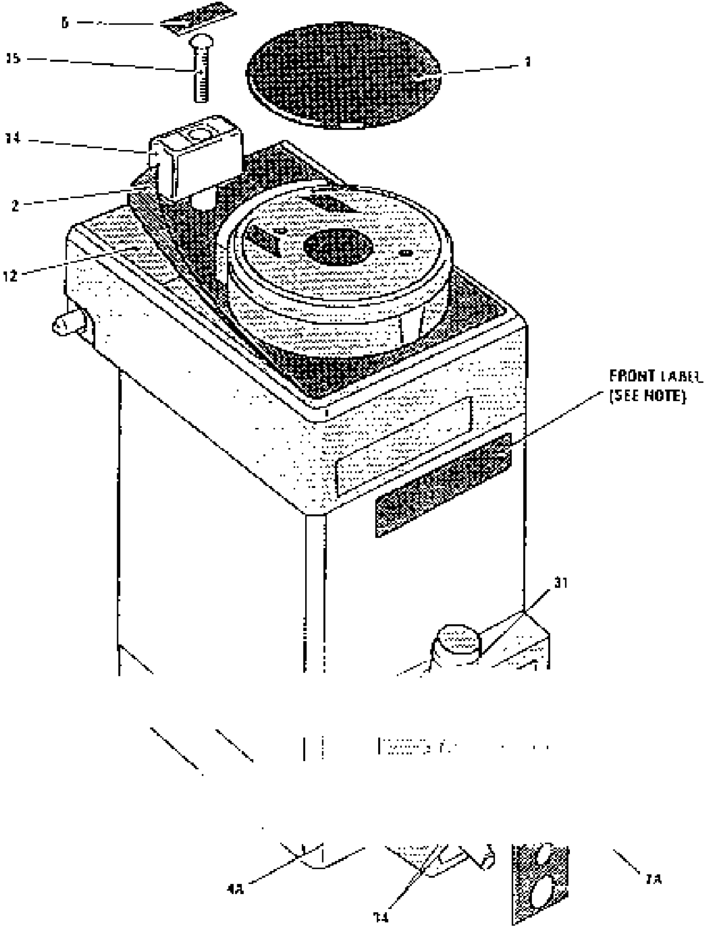

Fig. 3.1 Screw Cap Filler Labels And Covers

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2. Remove and dispose of the filler cover label (7A).

3. Stand the vaporizer on the base support tool Part No. 2802-8049-000. Referring to Fig. 3.1, remove the filler plug (31). Remove the two filler cover securing screws (34) and remove the filler cover (4A) by squeezing the sides and pulling the cover free from the vaporizer. Refit the filler plug.

4. Remove and dispose of the locking lever label (6). Remove the screw (15) and locking lever knob (14).

5. Remove and dispose of top plate label (2) from the top cover plate (12).

6. Invert the vaporizer and stand it on the dial. Remove the anti-tamper compound from the heads of the three screws (9), remove these screws (9), then remove the base cover (3).

7. Remove and dispose of the I/O label (140) to reveal the four screws (139). Remove the four screws (139) and remove the outer wrap (5A) by flexing it outwards and manoeuvring it free from the vaporizer.

8. Continue the disassembly procedure with Section 3.3, Disassembly - Interlock Mechanism.

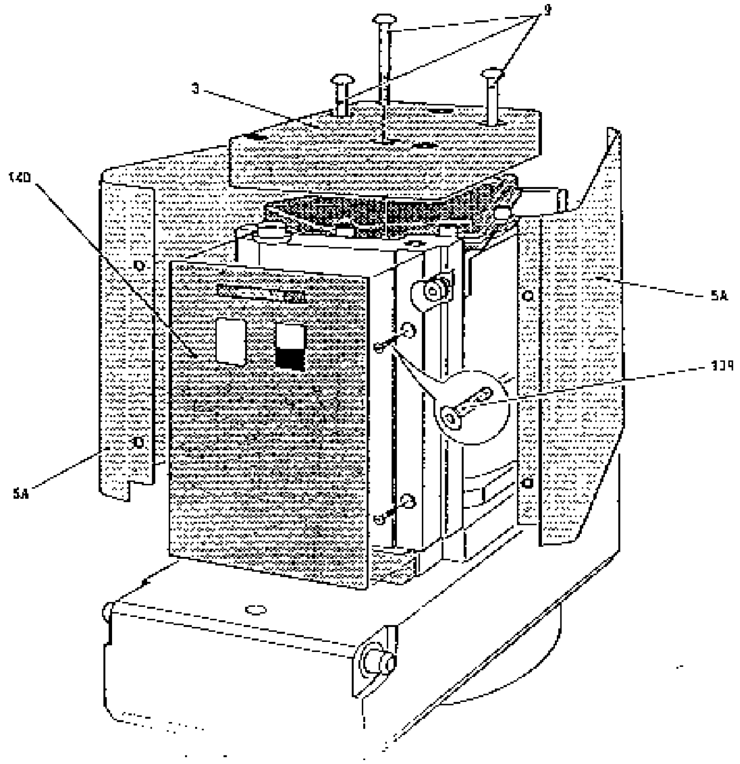

Fig. 3.3 Screw Cap Filler Outer Wrap Removal

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3.2.2 Keyed Filler (Figs. 3.3, 3.4 And 3.5)

1. Remove and dispose of the dial label (1).
2. Remove and dispose of the filler cover label (7B).
3. Remove and dispose of the locking lever label (6). Remove the screw (15) and locking lever knob (14).
4. Remove and dispose of top plate label (2) from the top cover plate (12).

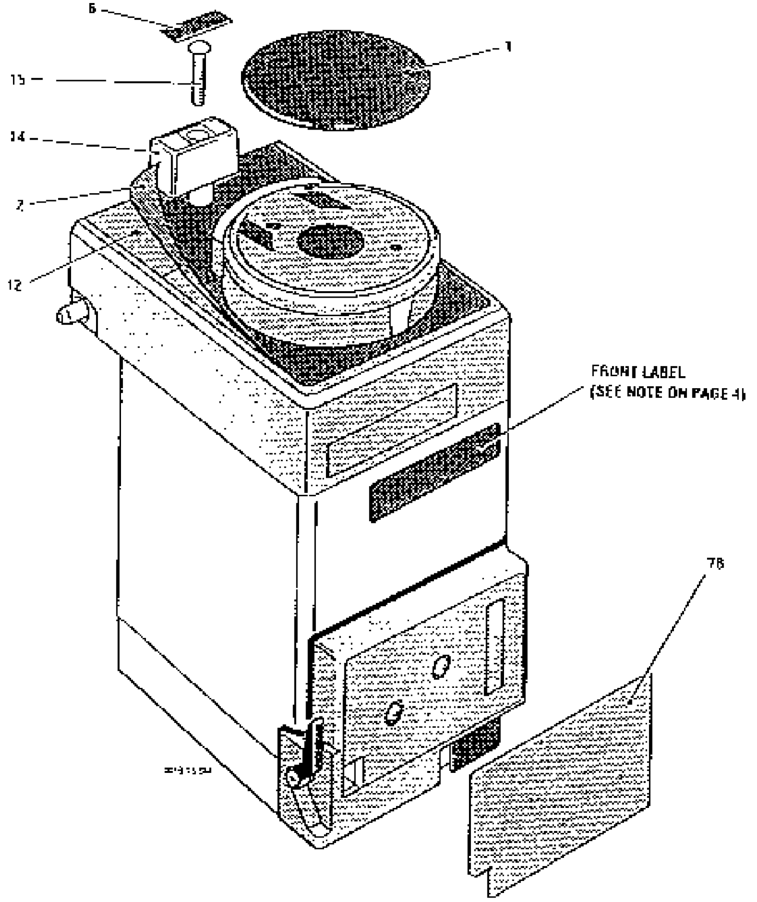

Fig. 3.3 Keyed Filler Labels Removal

5. Invert the vaporizer and stand it on the dial. Remove the anti-tamper compound from the heads of the three screws (9), remove these screws (9), then remove the base cover (3).

[illegible]
[illegible] washer (140) and lever [illegible]. Remove [illegible]
Remove screw(s) (174), pull the lever (165) and remove the cover (4B). Invert the vaporizer and remove screw (166), washer (167) and valve lever (165). Dispose of washer (167)

Note: If the vaporizer incorporates a clamp lever with hexagonal flats, illustrated as lever (149X) in Fig 3.4, it must be updated.

[illegible]: the information contained herein must not be disclosed to a third party without the written consent of Ohmeda

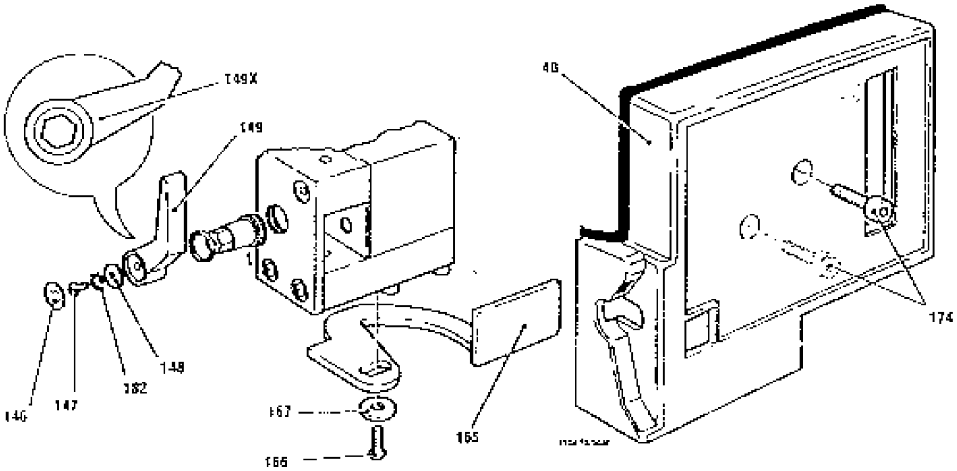
149X
149
40
40
174
146
147
182
148
167
166
165

Fig. 3.4 Keyed Filler Cover Removal

7 Remove and dispose of the I/D label (140) to reveal the four screws (139). Remove the four screws (139) and remove the outer wrap (5A) by flexing it outwards and manoeuvring it free from the vaporizer.

8. Continue the disassembly procedure with Section 3.3, Disassembly - Interlock Mechanism.

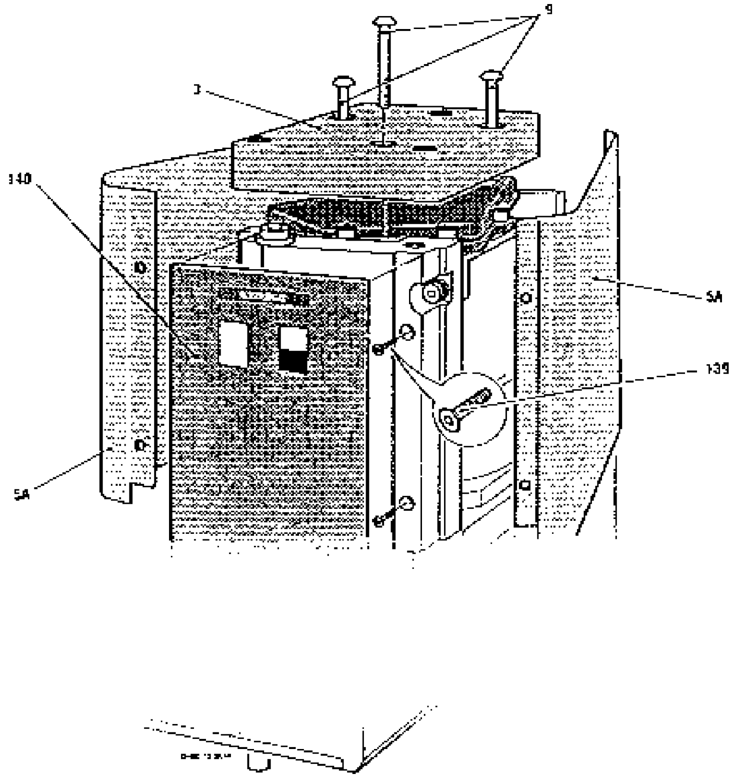
9
3
140
5A
139
5A

Fig. 3.5 Keyed Filler Outer Wrap Removal

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3.3 Disassembly - Interlock Mechanism

3.3.1 Interlock Block - Both Types (Fig. 3.6)

1 Stand the vaporizer on the vaporizer base support Referring to Fig. 3.6, remove the four screws (11) from the top cover plate (12) and then lift off the top cover plate, complete with the drive disc (64) and the dial assembly (71). Dispose of the top cover plate if it does not have the latest type shaped cutout as shown in Fig 3.15.

2. Remove the two screws (13) from the dial and remove the drive disc (64). Dispose of the drive disk if it has visible thread, shown as type C in Fig 3.15

3. Remove the dial release (72) and the two springs (40) from the dial assembly.

4. Remove and dispose of the bush (55) from the locking lever spindle (79).

5. Remove the four cap screws (76) which secure the four bearing bushes (57)

6. Remove and retain the bell crank assembly (63), lever platform (56) and the platform assembly (85). Dispose of the four bearing bushes (57).

7. Remove the two seal housings (66) from the actuator spindle (86). Remove and dispose of the two 'O' rings (69) and springs (65) from the platform assembly.

8. Remove the screw (62) from the bell crank assembly (63) and then remove and dispose of the roller (77).

9. Remove and dispose of the circlip (60). Withdraw the pin (58) and remove and dispose of the plunger (59).

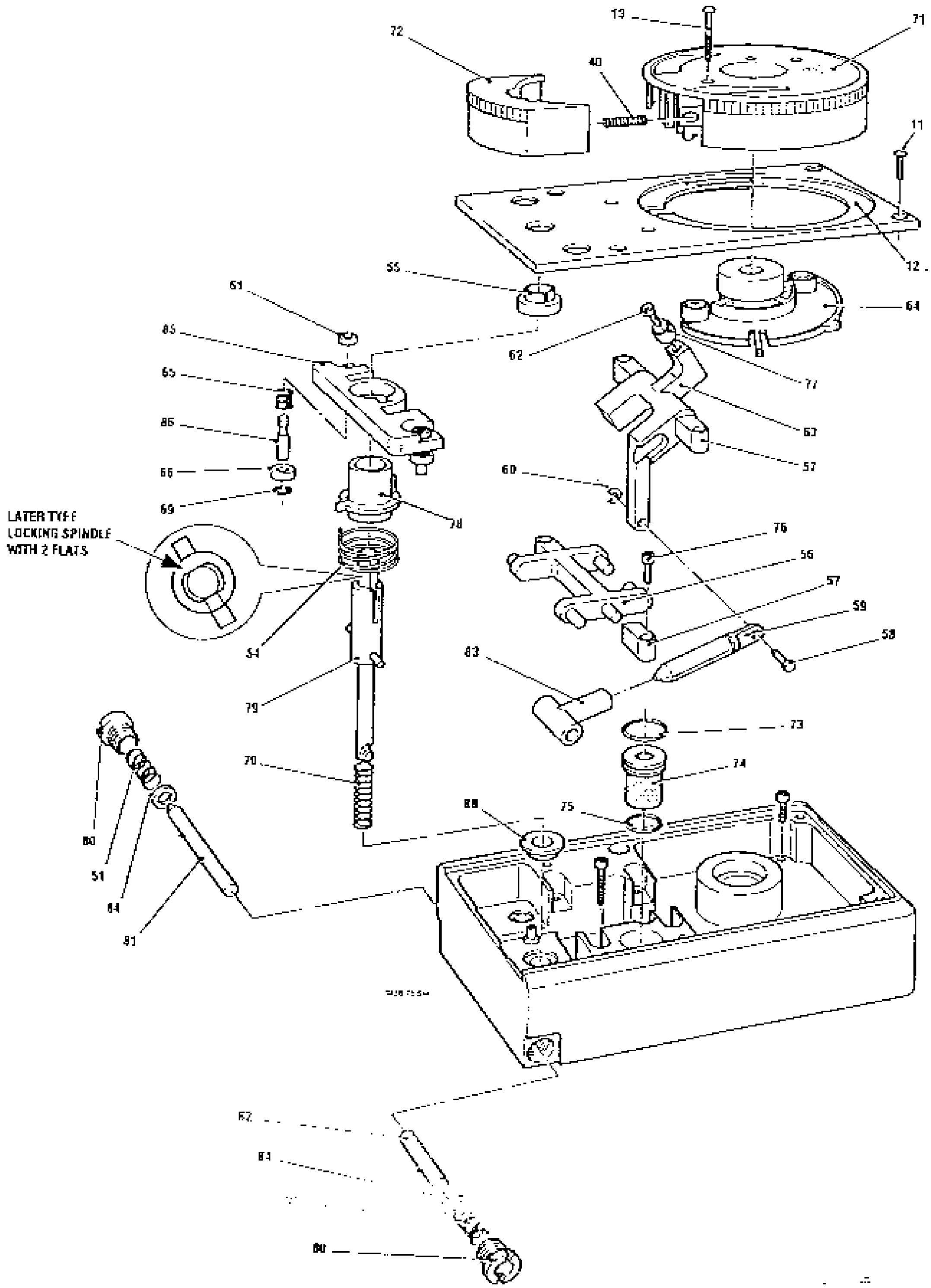
10 Lift out the locking collar (78), the locking spindle (79) and spring (54). Remove the locking spring (70). Dispose of springs (54) and (70).

11. Use tool Part No. 2802-8012-000 to remove the two retaining screws (80), the long interlock rod (81) and the short interlock rod (82). Remove and dispose of the two springs (51). Remove and retain the two washers (84).

12. Remove and dispose of the interlock bush (83) from inside the interlock block. Invert the interlock block and use a punch to tap out the bush (88). Dispose of the bush (88).

13. Use a standard M8 x 1 25 screw to lift out and dispose of the filter (74) from the interlock block and dispose of the 'O' rings (73) and (75)

[illegible]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82
81
80

Fig. 3.6 Interlock Mechanism Disassembly

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3.4 Disassembly - Fillers

3.4.1 Screw Cap Filler (Fig. 3.7)

1. Remove the six screws (22) which secure the clamp plate (20)
2. Remove the window clamp plate (20), the sight glass (23), the seal (21) and the seal (32). Dispose of the seal (21) and seal (32). Remove the back plate (179).
3. Remove the two screws (29) and one screw (28) which secure the filler body to the sump and remove the filler body assembly (36).
4. Remove and dispose of the seal (180) which is located on the two dowels on the sump body.
5. Remove and dispose of the drain plug assembly (25 and 26) and the 'O' ring (33) for the filler cover

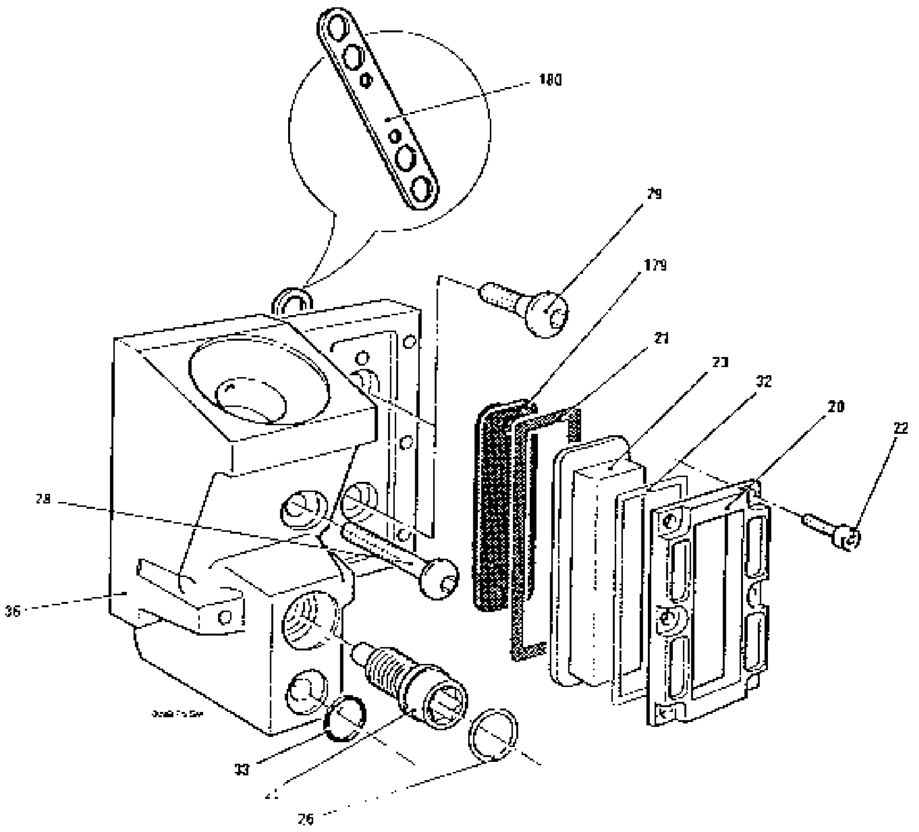


Fig. 3.7 Screw Cap Filler Disassembly

3.4.2 Keyed Filler (Figs. 3.8 And 3.9)

[illegible]

[illegible]

3. Remove the back plate (179). Remove the two screws (176) and the window body (172) from the sump.

4. Remove and dispose of the seal (180) which is located on the two dowels on the sump body.

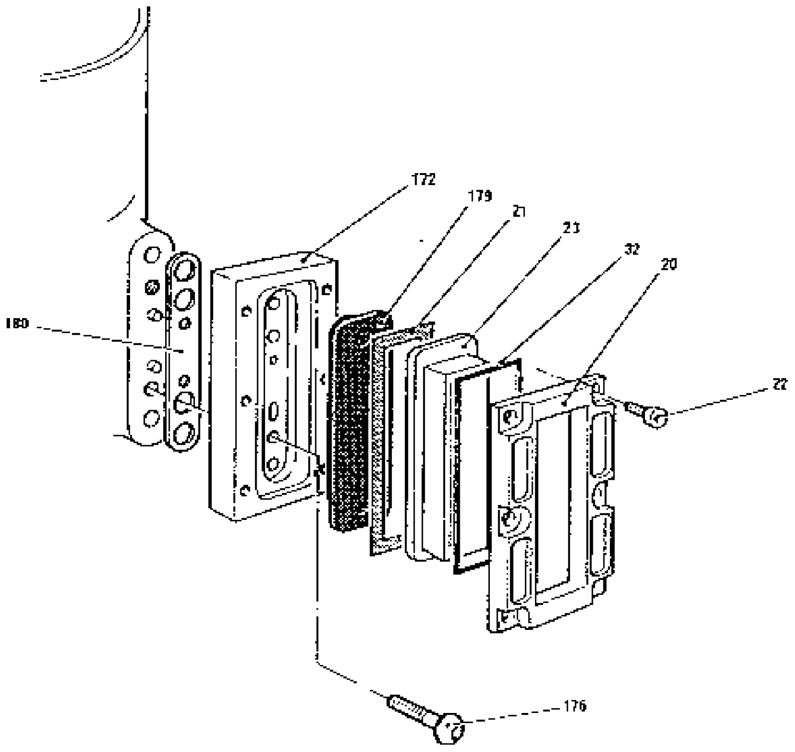


Fig. 3.8 Window Body Removal - Keyed Filler

5. Remove the two screws (158) from the top block (157) and remove one screw (178) from the valve block (156). Remove screw (183)

6. Remove the complete keyed filler assembly and dispose of the seals (160 and 161).

7. Remove the clamp screw (151) from the bridge piece (153). If the vaporizer incorporates a clamp screw with hexagonal flats dispose of both the clamp screw and the bridge piece

8. Remove the two screws (152), one screw (150) from the bridge piece (153). Remove the bridge piece and remove and dispose of the gasket (154)

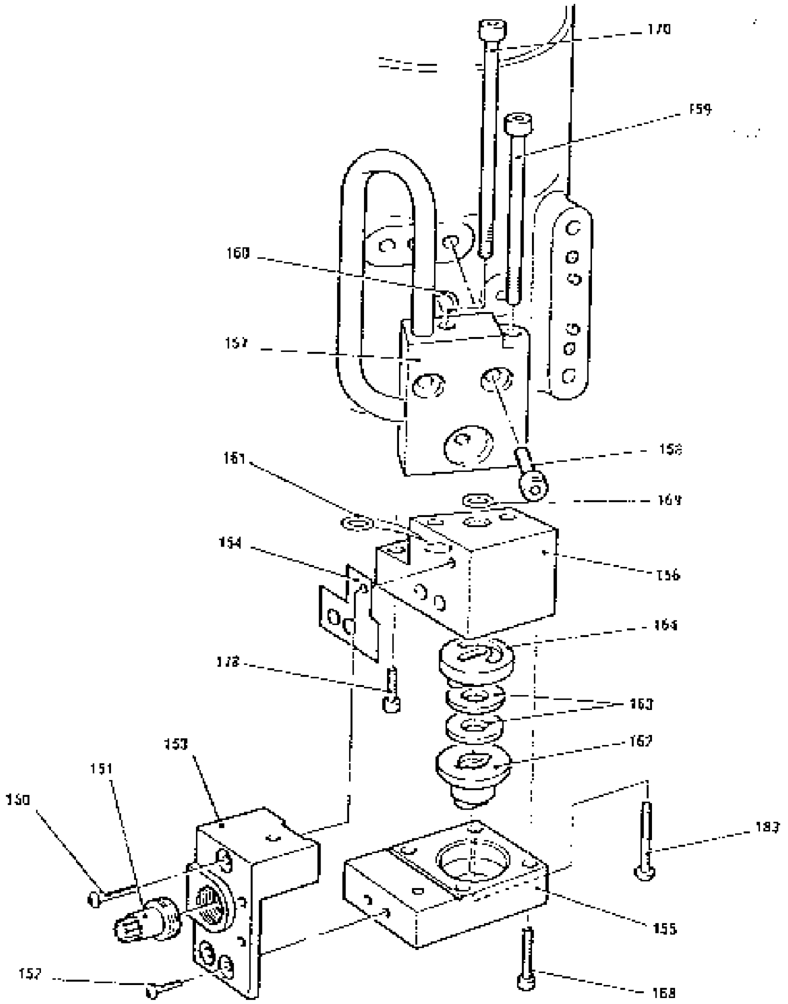


Fig. 3.9 Keyed Filler Body Disassembly

⚠ **Caution: Do not damage the lapped faces of the valve (164) and valve block (156).**

9 Remove the three screws (168) from the lower block (155). Remove the valve drive (162), remove and dispose of the two disc springs (163) and remove the valve (164) from the lower block (155) taking care not to damage the lapped mating faces of the valve (164) and the valve block (156).

10 Remove screw (158) and screw (17[illegible]) which attach the top block to the valve block (156). Remove and retain the top block.

11. Remove and dispose of the seal (169) from the valve block.

[illegible]

3.5 Disassembly - Sump

3.5.1 Transfer Manifold (Fig. 3.10)

1. Remove the two screws (108) from the bottom of the transfer manifold and remove the two screws (53) from inside the interlock block.

2. Remove the transfer manifold (109) and lift out the hollow dowels (102).

3. Remove and dispose of the two 'O' rings (103) and the two 'O' rings (110), remove the plug (104), the seal (105), the spring (106), and the restrictor (107). Dispose of the seal (105) and the spring (106).

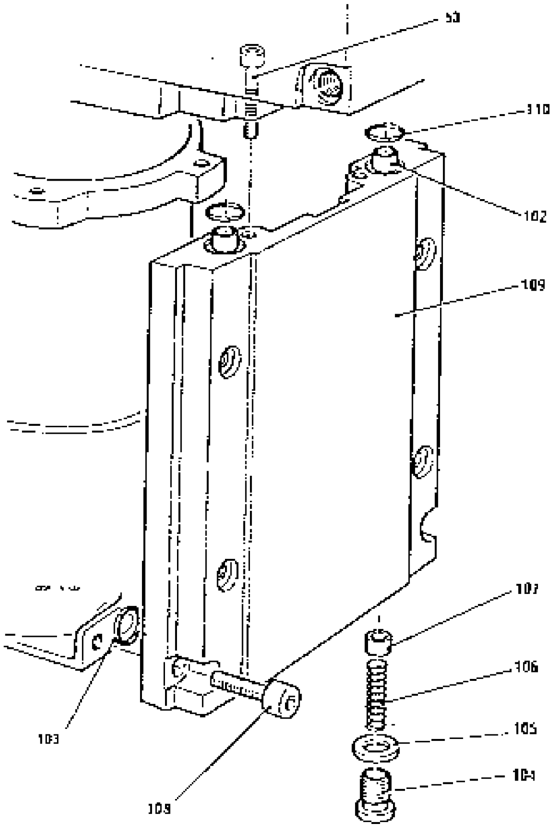


Fig. 3.10 Transfer Manifold Disassembly

[illegible]

3.5.2 Sump, Sump Cover And Interlock Block (Fig. 3.11)

1. Invert the vaporizer and place it on a clean surface.
2. Referring to Fig 3.11, remove the five screws (90) and washers and lift off the sump assembly from the sump cover.
3. Remove and dispose of the 'O' ring (100)
4. Carefully slide the sump sleeve (111) from the outer wick (101) and remove and dispose of the 'O' ring (113)
5. Remove and dispose of the outer wick (101) and the spiral wick (92)
6. Remove the five screws (99) and remove the spinning assembly (98) and the copper gasket (112).
7. Remove the two screws (96) and remove the plastic I P P V assembly (95) Remove and dispose of the 'O' ring (94).
8. Turn the vaporizer upright, remove the four screws (52) which secure the interlock block to the sump cover.

⚠ **Caution: When lifting off the interlock block, take care that the rotary valve remains in position on the sump cover otherwise damage may occur to the mating machined faces.**

9. Lift off the interlock block, taking care that the rotary valve remains in position on the sump cover Remove and dispose of the short self-adhesive strip (141).
10. Carefully remove spring (47) and the two washers (46) and (48) from the rotary valve (49). Dispose of the washers (46) and (48)
11. Carefully lift off the rotary valve (49) and place it on a clean protective surface.
12. Remove and dispose of the two small O' rings (43) one large diameter 'O' ring (44) and the quad ring seal (45) from the bottom face of the interlock block
13. Continue the sequence with Section 3.6 Cleaning

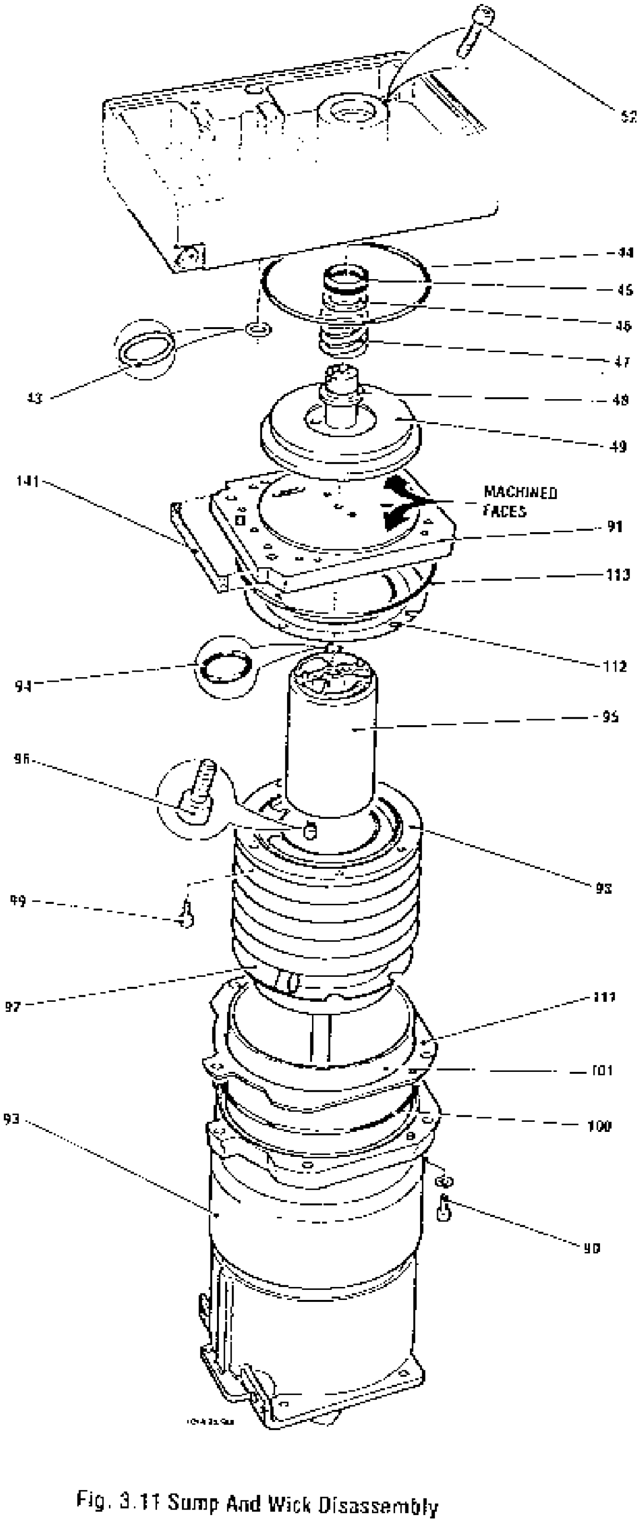

52
44
45
46
47
43
48
49
141
MACHINED FACES
91
113
112
94
95
96
92
99
97
111
101
100
93
90

Fig. 3.11 Sump And Wick Disassembly

3.6 Cleaning

3.6.1 Thermostat Assembly

⚠ **Caution: When the thermostat has been cleaned, the thermostat cover must be fitted to allow the sump to be cleaned without causing damage to the thermostat.**

1. Remove the screws (132) and washers (if fitted). Remove the thermostat cover (135) and dispose of the gasket. If the thermostat cover is damaged, dispose of the cover with the plug and seal (if fitted) and issue the vaporizer with a new type cover.
2. If the cover is the type which seals on to a gasket as shown in Fig. 3.12, dispose of the cover (135) and gasket (133)
3. Apply an air supply of approximately 200 kPa (30 p.s.i.) to the thermostat assembly to blow away any particles of dirt
4. To enable the sump assembly to be cleaned without touching the thermostat components, temporarily refit the thermostat cover to the sump base using two screws (132) fitted diametrically opposite to each other. Ensure that the plug and seal remain in place.

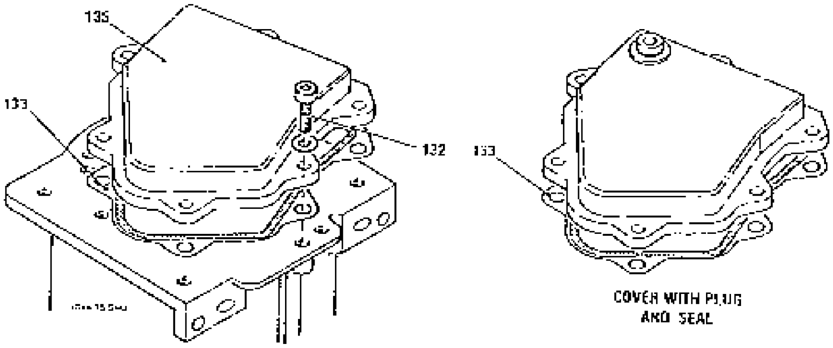


Fig. 3.12 Thermostat Cover

3.6.2 Hand Cleaning Of Components

⚠ **Warning: When cleaning components by hand the process must be performed using adequate extraction or inside a fume cupboard.**

⚠ **Caution: When cleaning plastic components, a cold cleaning agent must be used. If a hot cleaning agent is used, there is the possibility of component distortion.**

Note: Local safety regulations must be observed when using cleaning agents.

[illegible] by hand using either Genklene or an alternative cleaning agent which is approved by Ohmeda Steeton.

3.7 Reassembly And Tests

3.7.1 Thermostat Test (Fig. 3.13)

Perform the following pressure test to determine whether or not the thermostat is still within tolerance. If the thermostat is IN tolerance, continue with the [illegible] procedure. If the thermostat is OUT of tolerance, refer to Section 3.13 Sump And Thermostat Servicing And Test Procedure.

Before performing the pressure test, the assembly must have stood in a temperature controlled room for a minimum of three hours at a temperature of 22 ± 1 deg. C

1 Remove the thermostat cover from the sump assembly.

2. Ensure that the water manometer is reading Zero at 5 litres/minute air flow with the thermostat test rig in circuit and the thermostat out of circuit.

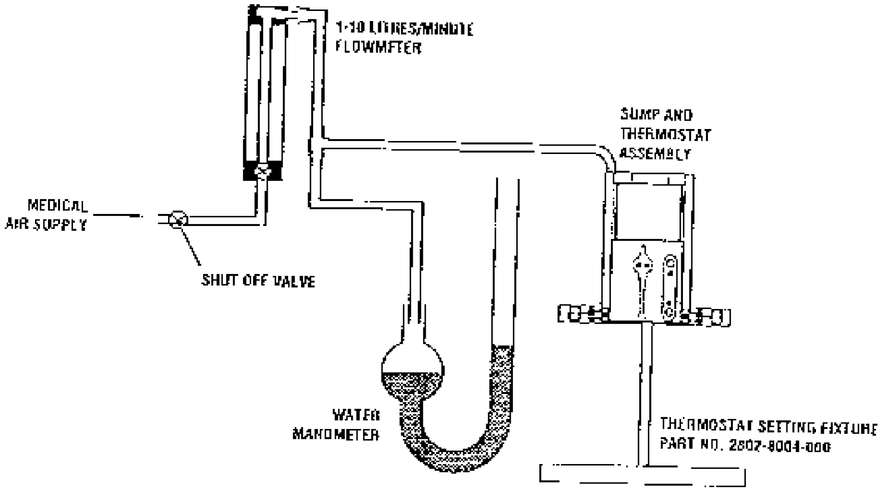

1-10 LITRES/MINUTE FLOWMETER
SUMP AND THERMOSTAT ASSEMBLY
MEDICAL AIR SUPPLY
SHUT OFF VALVE
WATER MANOMETER
THERMOSTAT SETTING FIXTURE PART NO. 2802-8004-000

Fig. 3.13 Thermostat Pressure Test

3. Ensure that the temperature of the test air is as close as possible to 22 deg. C.

4. Maintain a flow of 5 litres/minute and connect the thermostat assembly to the thermostat setting fixture Part No. 2802-8004-000, as illustrated on Fig. 3.13.

Hal Thermostats		Enf., Sevo. And Iso. Thermostats	
Temperature deg. C	Pressure Setting mm H_2O	Temperature deg. C	Pressure Setting mm H_2O
21.0	106	21.0	107
21.2	105	21.2	105
21.4	103	21.4	104
21.6	102	21.6	102
21.8	101	21.8	101
22.0	100	22.0	100
22.2	99	22.2	99
22.4	98	22.4	97
22.6	97	22.6	96
22.8	96	22.8	95
23.0	95	23.0	94

Table 1. Thermostat Setting

5. Record the actual room temperature near the thermostat test rig and record the manometer reading as setting A on setting sheet 1 of 1 and check that it is within the tolerances ± 3 mm H_2O of the settings in Table 1.

6. Disconnect the air supply for approximately 3 seconds, reconnect the air supply and then record the manometer reading as setting B on the setting sheet. The thermostat should be within the tolerance of ± 3 mm

7. Fit a new gasket and the thermostat cover to the sump assembly using six screws and washers. Tighten the screws to 2 Nm in the torque sequence shown in Fig 3.36.

3.7.2 Interlock Block Assembly (Fig. 3.14 and 3.15)

Note: When fitting the top cover plate (12), ensure that it is of the latest specification with the 15 deg. angle at the stop position as shown in Fig. 3.15

1. Grease the new springs (51) with fluorinated grease and fit the springs (51) and washers (84) onto each interlock rod (81) and (82)

2. Fit both interlock rods through the interlock block (42) and into the new interlock bush (83) and secure with the retaining screws (80). Torque tighten the retaining screws to 2 Nm. Ensure that the short interlock rod (82) is fitted to the left of the block, as viewed from the front.

3. Fit a new seal (75) into the interlock block, fit a new 'O' ring (73) to a new filter (74), and then fit the filter (74) in position in the interlock block

4. Invert the interlock block assembly and fit two new seals (43) and one new large seal (44) to the interlock block.

5. Lightly smear a new quad ring seal (45) with fluorinated grease and fit it to the bore of the interlock block, using tool Part No 2802-8061-000.

6. Ensure that the mating faces of the rotary valve (49) and the sump cover are clean. Place the rotary valve in position on the sump cover with the hole facing the rear of the vaporizer at the 12 o'clock position. Fit a new Fluon washer (48) on the valve stem followed by compression spring (47) and new thrust washer (46), ensuring that the small outside diameter of the thrust washer is uppermost

7. Using a mandrel tool Part No. 2802-8013-000, fit the interlock block over the rotary valve. Torque tighten the four interlock block securing screws (52) to the sump cover diametrically opposite in turn to 2.6 Nm. Remove the mandrel. Torque the four securing screws (52) a second time to 2.6 Nm a second time

8. Insert the two screws (53) into the interlock block so that they hang loosely and can be used later to secure the transfer manifold.

9. Fit one new spring (65) and a seal housing (66) onto each spindle (86). Apply fluorinated grease to the new 'O' rings (69) and fit one onto each spindle of the platform assembly. Ensure that the 'O' rings are fitted into the seal housings and each housing [illegible]

11. Place a new interlock collar spring (54) into position ensuring that one end is fitted into the hole in the interlock block

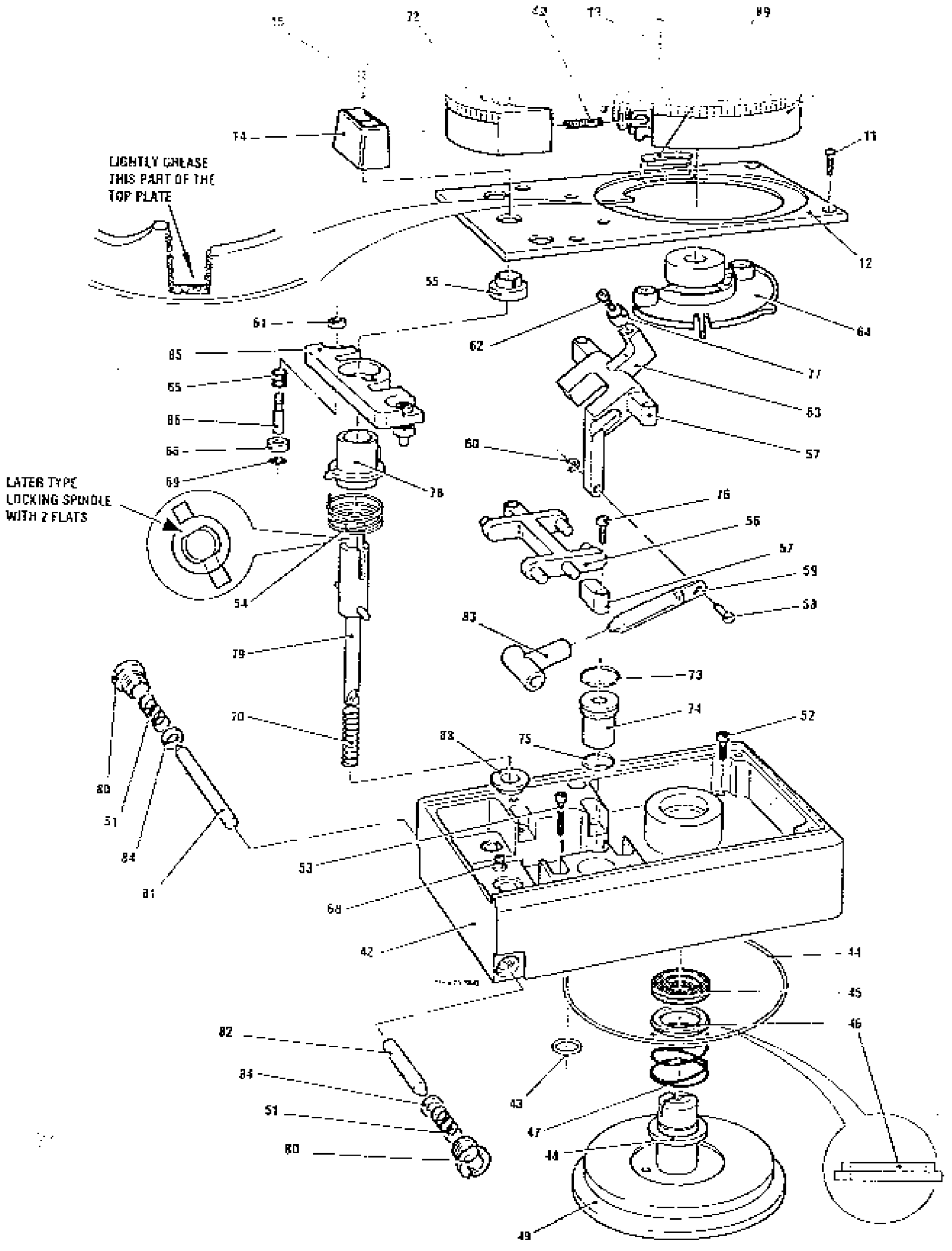

15
72
42
73
89
74
11
LIGHTLY GREASE THIS PART OF THE TOP PLATE
12
55
64
61
62
77
85
63
65
86
57
66
60
69
78
LATER TYPE LOCKING SPINDLE WITH 2 FLATS
76
56
57
59
54
58
83
79
73
74
52
70
88
75
80
51
84
53
81
68
42
44
45
46
82
84
43
51
47
80
48
49

Fig. 3.14 Interlock Block Assembly

Note: When rebuilding the interlock block, only the following combinations of locking lever, locking spindle and collar spring Part No's. are permitted.

Component Description	Combination 1 Part No's	Combination 2 Part No's.	Combination 3 Part No's.
Locking Lever	1105-7005-000	1105-7005-000	1105 3350-000
Locking Spindle	1105-7002-000	1105-7002-000	1105-7122-000
Collar Spring	1105-3076-000	1105-3354-000	1105-3354-000

Note: Locking spindle 1105-7122-000 incorporates two flats and can be identified by an identification mark as shown in Fig. 3 34

12. Lightly grease the bore and keyways of the locking collar (78) and fit the locking collar over the spindle (79). Ensure that the following criteria are satisfied:
    - a) The keyway in the spindle (79) faces left as viewed from the top and front
    - b) The end of the locking collar spring (54) locates in rear slot of locking collar (78).
    - c) The lug of the locking collar (78) locates in front of the stop pin (68)
13. Place the pivot pin (58) into the hole of a new interlock plunger (59) and then into the hole of bell crank (63). Secure in place with a new circlip (60) using interlock circlip applicator Part No 2802-8045-000.
14. Place a new roller (77) onto the stepped screw (62), fit it to the bell crank (63) and torque tighten to 0.6 Nm. Ensure that the roller revolves freely.
15. Lightly grease the bore, keyway and slots of the platform assembly (85) with fluorinated grease and fit the platform assembly over the spindle. Ensure that the slot is to the left of the interlock block when viewed from the front.
16. Insert the two pins of the lever platform (56) into the keyways of the platform. Fit two new bearing bushes (57) onto the central pins of the lever. Do not drop the assembly into position in the interlock block at this stage
17. Place two new bearing bushes (57) onto the pivot pins of the bell crank (63) and lightly coat the slots of the bell crank (63) with fluorinated grease.
18. Carefully locate the interlock plunger (59) into the interlock bush (83) and at the same time position the keyways of the bell crank (63) onto the pins of the lever platform (56)
19. Carefully position all four bearing bushes (57) into the slots in the interlock block so that the counter-bored recesses are uppermost. Secure with four screws (76). Torque tighten to 0.6 Nm
20. Referring to Fig. 3.15, either refit the drive disc (64) identified as Type A into the interlock block or fit a new drive disc identified as Type B into the interlock block. Ensure that the drive disc fits into the 'T' of the rotary valve.

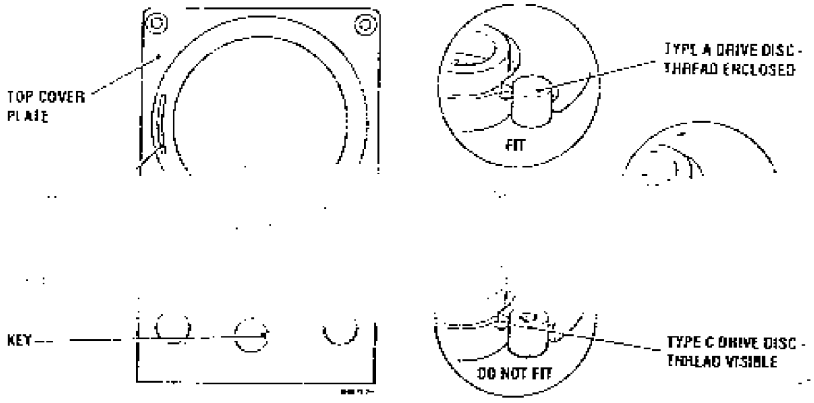

TOP COVER PLATE
TYPE A DRIVE DISC - THREAD ENCLOSED
FIT
KEY
DO NOT FIT
TYPE C DRIVE DISC - THREAD VISIBLE

Fig. 3.15 Top Plate And Drive Disc Identification

21. Fit the stop moulding (89) to a new style top cover plate (12). Grease the stop face of the cover plate as illustrated in fig.3.14. Fit the cover plate to the interlock block, ensuring that the key in the cover plate fits into the slot in the locking lever spindle bush (55).

22 Secure the cover plate with the four [illegible]

23 Lightly grease two new springs (40) and the inside of the dial release (72). Fit the springs into the dial (71) and then fit the dial release over the springs and into the dial. Remove any grease from the outer surface of the dial

24. Fit the dial assembly to the top of the interlock block while operating the dial release.

Note: If a disc identified as Type A is being refitted, use the screws Part No N122210 removed in Section 3.3.1 to secure the dial. However, if a new disc identified as Type B is being fitted, use new screws Part No. N122212 to secure the dial.

25. Fit the dial securing screws (13) through the dial and into the drive disc. It may be necessary to manoeuvre the drive disc in order to engage the screws. Torque tighten the screws to 1.0 Nm using tool Part No. 2802-8052-000.

26. Fit the locking lever (14) onto the locking spindle (79) ensuring that the one or two flats locate fully onto the one or two flats on the spindle. Secure it with screw (15). Torque tighten to 1 Nm and check that there is no vertical movement of the locking lever on the spindle.

27. Press down the locking lever and rotate it to the locked position, pull in the dial release and check that the interlock rods (81 & 82) extend outwards and that the dial can be rotated from the OFF position.

28 Turn the dial to the OFF position, check that the dial release returns to the unlocked condition and that the extension rods (81 & 82) retract. Release the locking lever (14) and check that it springs up to the OFF position

3.7.3 I.P.P.V. Resistance And Leak Tests

Note: The following resistance and leak tests are to check that the I.P.P.V assembly is not cracked or damaged. If the I.P.P.V. assembly is damaged, the tests will not be within the required tolerances and a new I.P.P.V. assembly must be fitted.

3.7.3.1 Resistance Test

1. Set up the test equipment with a 1 to 10 litres/minute flowmeter as illustrated in Fig. 3.16 ensuring that the manometer reads zero with an air flow of 6 litres/minute prior to fitting the I.P.P.V. assembly. Fit a new seal (item 94 on Fig. 3.11) to the I.P.P.V assembly as shown on Fig. 3.11 and fit the assembly to the test plate Part No. 2802-8060-000 with the two screws (96)

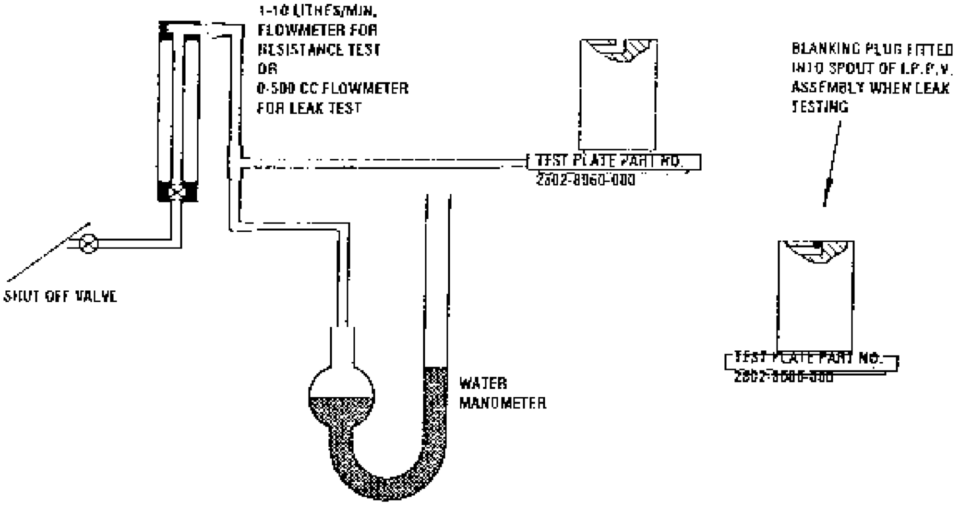

1-10 LITRES/MIN. FLOWMETER FOR RESISTANCE TEST OR 0-500 CC FLOWMETER FOR LEAK TEST
BLANKING PLUG FITTED INTO SPOUT OF I.P.P.V. ASSEMBLY WHEN LEAK TESTING
TEST PLATE PART NO. 2802-8060-000
SHUT OFF VALVE
WATER MANOMETER
TEST PLATE PART NO. 2802-8060-000

Fig. 3.16 Resistance And Leak Tests Of I.P.P.V. Assembly

2. Adjust the shut off valve until a reading of 6 litres/minute of air is indicated on the flowmeter and verify that the height indicated on the manometer does not increase by more than 3.5 cm H_2O.

3. Turn OFF the shut off valve.

3.7.3.2 Leak Test

1. Place a blanking plug in the spout of the I.P.P.V. assembly and connect a 0-500 cc/minute flowmeter Part No. 2802-8056-000 in place of the 10 litres/minute flowmeter, as shown in Fig.3.16

2. Adjust the shut off valve until a reading of 100 cc/minute of air is indicated on the

4. If the I.P.P.V. assembly fails either test, fit a new I.P.P.V. assembly and retest.

[illegible]

3.7.4 Sump And Wick Assembly (Figs. 3.17, 3.18 And 3.19)

1 Invert the interlock block assembly and place it on a protective surface. Fit a new seal (94) to the I.P.P.V. assembly (95). Position the two locating pins of the I.P.P.V. assembly into the holes in the sump cover (91) and [illegible] the I.P.P.V. assembly [illegible]

[illegible] the gas transfer hole of the copper gasket are aligned with the holes in the sump cover

3. Fit the spinning assembly (98) to the sump cover and secure with the five screws (99). Torque tightening them to 2 Nm in the sequence illustrated on Fig. 3.18. Torque tighten the securing screws to 2 Nm for a second time in the same sequence

⚠ **Caution: Do not occlude any gas passageway holes.**

4. Using a new spiral wick assembly (92) and starting just left of the hole in the spinning assembly (98) with the bound end of the wick against the assembly, wind upwards in a clockwise direction. The end of the wick must finish on the spinning assembly as shown in Fig 3.17, ensuring that the bound end is positioned against the spinning assembly. Tuck the bound end under the flange.

5 Fit the new outer wick (101), folded end first, over the spiral wick so that the bottom of the outer wick is on the centre line of the bottom coil of the spiral wick.

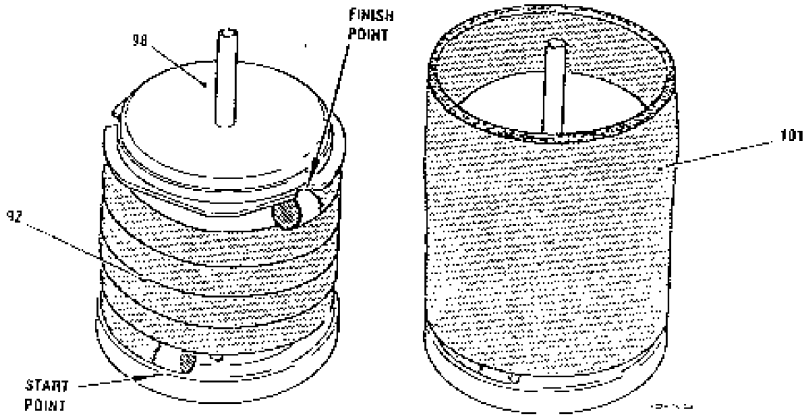
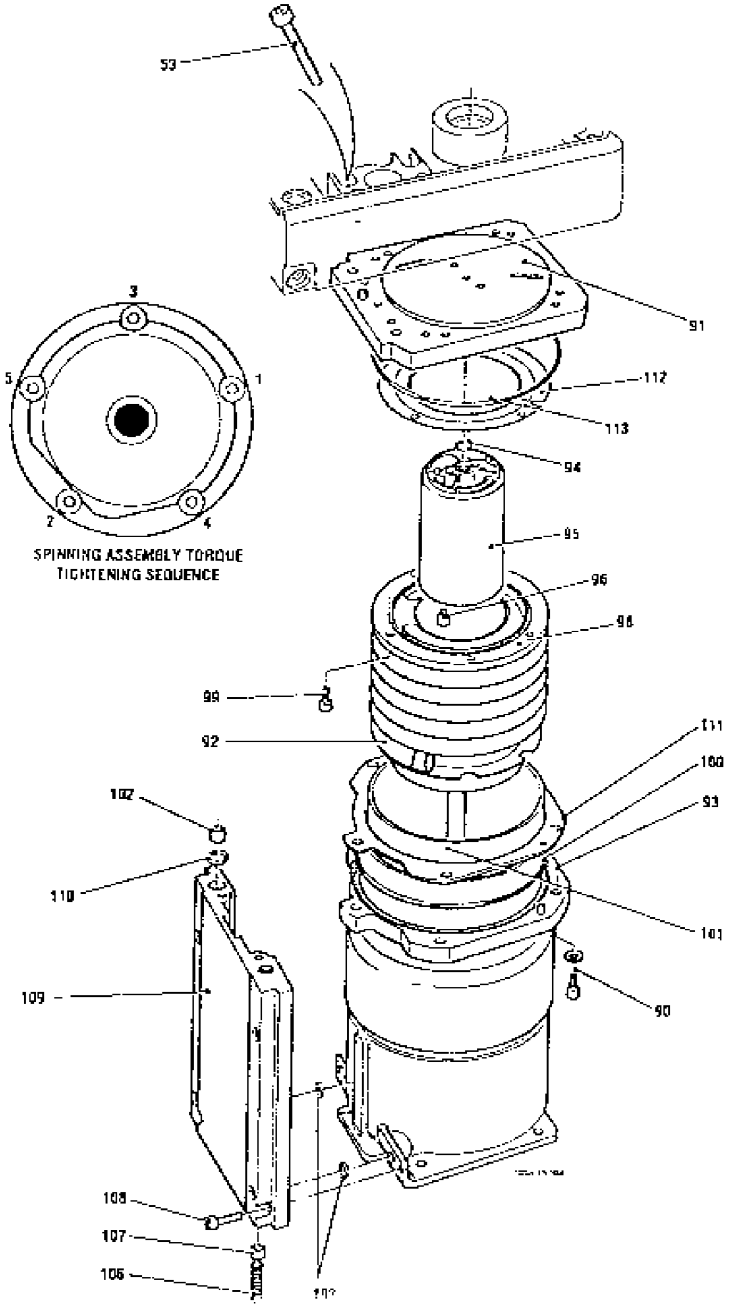


Fig. 3.17 Spiral And Outer Wick Assembly

6 Fit a new seal (100) to the sump assembly. Fit the sump sleeve (111) over the outer wick assembly, ensuring that the holes in the wick line up with the holes in the sump cover. Fit the sump (93) over the complete assembly. Lower the sump assembly over the outer wick in a straight downward line with no twisting movement, ensuring that the sump dowels locate into the two holes on the sump cover

7 Secure the sump assembly to the sump cover using the five screws (90) and washers. Ensure that the screws are secured in the same sequence as for the spinning assembly illustrated in Fig. 3 18. Torque tighten to 2.6 Nm. Torque tighten the securing screws to 2.6 Nm for a second time


SPINNING ASSEMBLY TORQUE
TIGHTENING SEQUENCE

8. Visually inspect the gas transfer manifold (109) for any signs of cracking adjacent to the hole plug, as shown in Fig. 3.19. If no cracks are found, the gas transfer manifold may be reassembled onto the vaporizer.

   If there is any evidence of cracking, the gas transfer manifold must be discarded and replaced with a new item. Part No. 1105-3282-000. Gas transfer manifold Part No. 1105-3282-000 must only be assembled using nitrile 'O' rings (103) Part No. 017 [illegible]

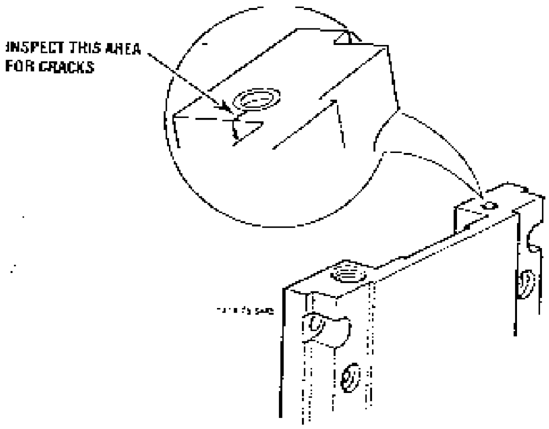


Fig. 3.19 Gas Transfer Manifold

9. Fit two new seals (103), two new seals (110) and the two hollow dowels (102) to the transfer manifold (109).

⚠ **Caution: Ensure that the screws (53) are torque tightened before screws (108)**

10. Lay the vaporizer on its front face and fit the transfer manifold by securing it loosely with the two screws (108) which secure it to the sump base and the two screws (53) which protrude from the interlock block. Torque tighten screws (53) through the interlock block to 2 Nm., followed by the two screws (108), torque tightened to 2 Nm. Torque tighten the screws to 2 Nm for a second time

11. Fit the restrictor (107) flat face first and then fit a new spring (106), a new seal (105) and a plug (104) to the bottom of the transfer manifold. Torque tighten to 2.6 Nm

3.8 Final Assembly - Fillers

3.8.1 Screw Cap Filler Assembly (Fig. 3.20)

1. Fit a new washer (26) onto a new drain plug (25)

2. Screw the drain plug assembly into the filler body (36), using the hexagon end of the filler plug (31).

3. Fit a new seal (24) onto the filler plug (31), using Tool No. 2802-8002-000. Ensure that two dowels (145) are fitted into the dowel holes in the sump, then fit a new seal (180) onto the two dowels.

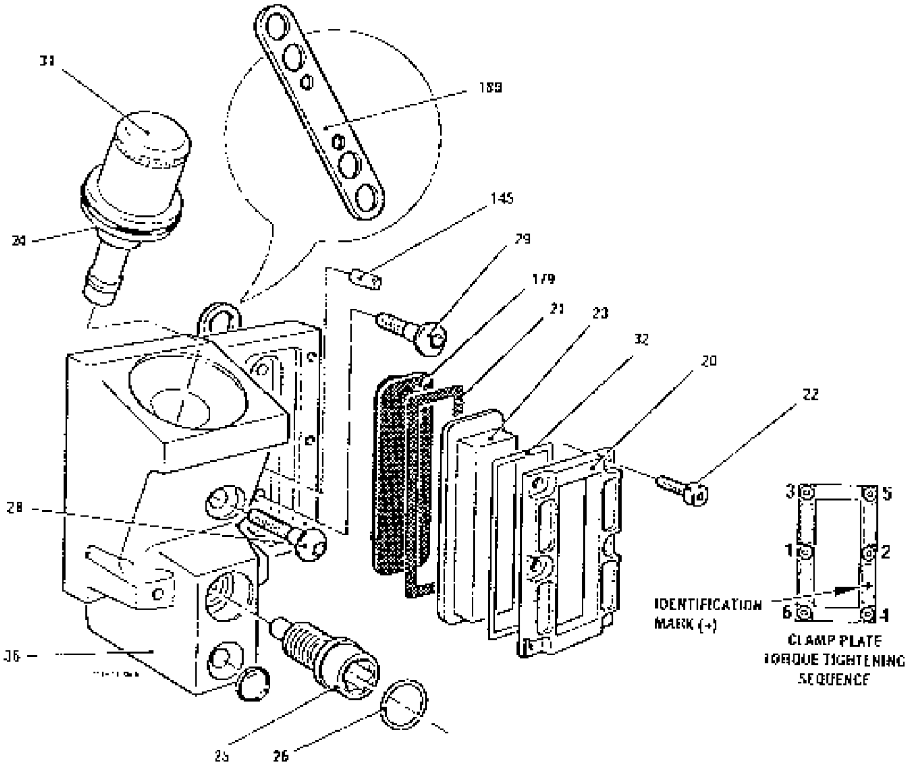

31
180
145
29
179
21
23
32
20
22
24
28
36
25
26
3
5
1
2
6
4
IDENTIFICATION MARK (+)
CLAMP PLATE TORQUE TIGHTENING SEQUENCE

Fig. 3.20 Screw Cap Filler Assembly

4. Fit the filler body (36) to the sump using the two screws (29) and one screw (28). Torque tighten to 2.6 Nm.

5. Fit the back plate (179), ensuring that the small hole is at the bottom, and fit the new

⚠ **Caution: When fitting the clamp plate (20), loosely fit the six screws (22), then gradually tighten them in the sequence shown in Fig. 3.[illegible].**

3.8.2 Keyed Filler Assembly (Figs. 3.21, 3.22 And 3.23)

⚠ **Caution: Do not damage the lapped faces of the valve block (156) and valve (164).**

3.8.2.1 First Stage

1. Fit the assambly fixture alignment pin, seal end first, into the centre hole in the valve block (156).

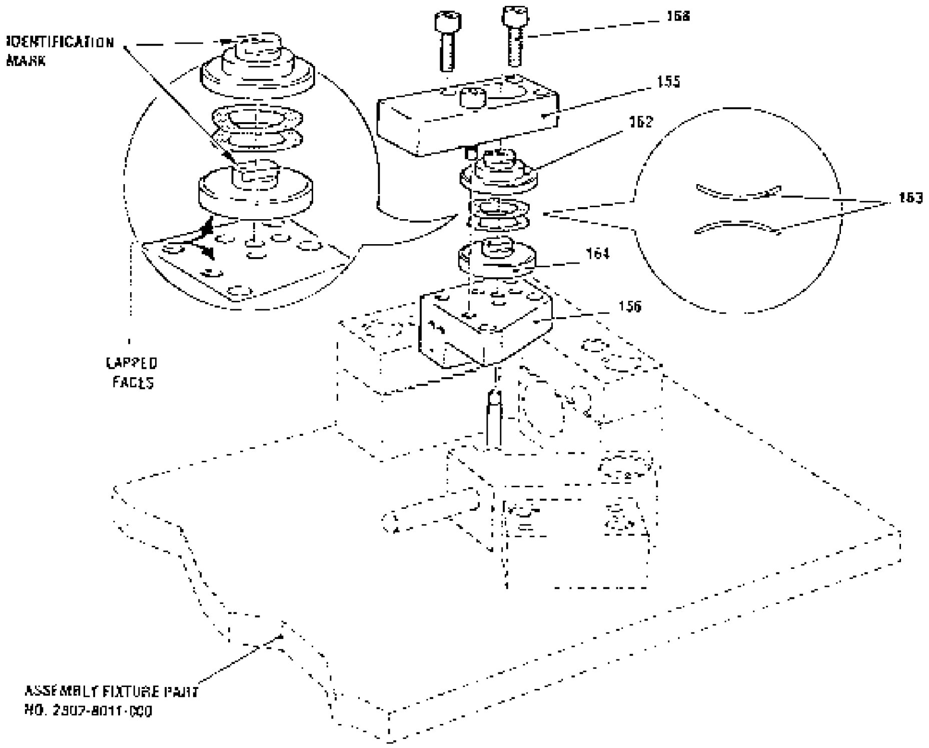

IDENTIFICATION MARK
168
155
162
163
164
156
LAPPED FACES
ASSEMBLY FIXTURE PART NO. 2907-8011-000

Fig 3.21 Valve Block Assembly Fixture

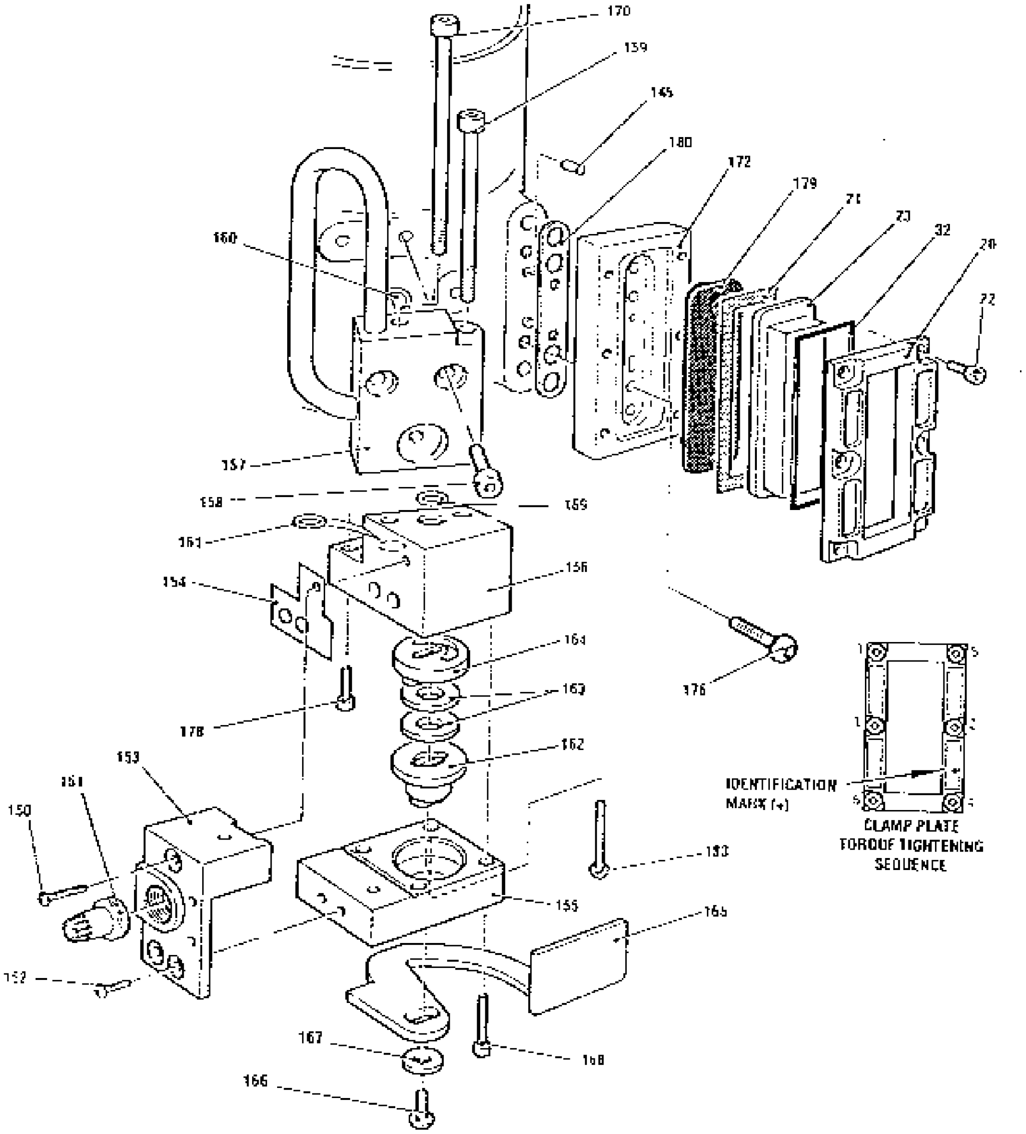

170
159
145
180
172
179
71
73
32
28
72
160
157
158
169
161
156
154
164
163
178
162
153
151
150
176
183
155
165
152
167
168
166
1
5
1
2
5
5
IDENTIFICATION MARK (+)
CLAMP PLATE TORQUE TIGHTENING SEQUENCE

Fig. 3.22 Keyed Filler Body Assembly

2. Fit the valve block (156) into the key filler assembly fixture Part No. 2802-8011-000 followed by valve (164) ensuring that the identification mark is to the left hand side as illustrated in Fig. 3.21.

3. Fit the two new disc springs (163) over the valve (164) stem ensuring that the first spring is positioned with its concave face down and that the second spring is posit

5. Remove the keyed filler assembly from the fixture. Then remove the alignment pin from the keyed filler assembly.

6. Fit a new bridge gasket (154) into the groove in the lower block (155) and press the spigot into the valve block (156). Fit a new agent specific [illegible]

[illegible] screw (159) and the longer screw (170).

3.8.2.2 Leak Test

Note: The volume of the test circuit pipework, from the shut off valves to the test fixture sump, excluding the reservoir, must not exceed 100 cm³, which is 10% of the sump volume

1. Set up the test equipment as shown in Fig. 3.23

Note: The reservoir must be isolated from the circuit for this test by closing shut off valve No. 2

2. Attach the keyed filler assembly to the test fixture sump, Part No. 2802-8016-000, using two screws (158), one screw (178) and the hexagon socket button head screw (183). Torque tighten the screws (159) and (170) to 2 Nm then torque tighten the four screws (158), (178) and (183) to 2 Nm. Ensure that the keyed filler valve is in its fully closed position.

3. Open shut off valve No. 1 and adjust it until the circuit is pressurised to 200 mm Hg as indicated by the manometer. Allow the pressure to stabilise and note the pressure drop in 30 seconds.

Tolerance: The indicated pressure drop in 30 seconds must not exceed 2 mm Hg.

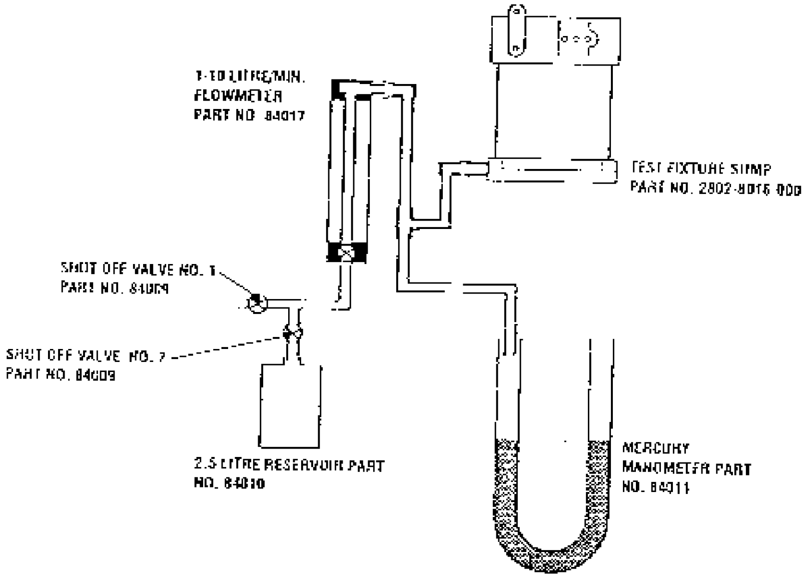

1-10 LITRE/MIN.
FLOWMETER
PART NO 84017
TEST FIXTURE SUMP
PART NO. 2802-8016-000
SHUT OFF VALVE NO. 1
PART NO. 84009
SHUT OFF VALVE NO. 2
PART NO. 84009
2.5 LITRE RESERVOIR PART
NO. 84010
MERCURY
MANOMETER PART
NO. 84011

Fig. 3.23 Leak Test - Keyed Filler Assembly

4. Remove the keyed filler assembly from the test fixture sump.

5. If the keyed filler is **NOT** within the specified tolerance, disassemble the keyed filler assembly, then repeat the instructions described in Section 3.8.2.1 and 3.8.2.2.
If the keyed filler assembly **IS** within the tolerance, continue the procedure as follows.

3.8.2.3 Final Stage

1. Referring to Fig. 3 22, insert the clamp screw (151) into the bridge piece (153) and then invert the vaporizer onto its dial.

2. Position the keyed filler on to the sump and secure the key filler assembly to the base of the sump assembly with one screw (183) through the lower block (155) and valve block (156) and one screw (178) through the valve block (156). Fit the top block (157) to the sump assembly with the two screws (158). Torque tighten the screws (158) to 2 Nm and then torque tighten screws (183) and (178) to 2 Nm

3. Ensure that two locating dowels (145) are fitted in the dowel holes in the sump, then fit the seal (180) to the two dowels and secure the window body (172) to the sump assembly with the two screws (176). Torque tighten to 2 Nm

4. Fit the back plate (179) into the window body (172) with the small hole of the back plate nearest to the base. Fit a new window seal (21) inside the window body (172).

5. Fit the sight glass on the window seal in the window body and attach a new sight glass seal (32) around the periphery of the sight glass (23).

⚠ **Caution: When fitting the clamp plate, loosely fit the six screws (22), then gradually tighten them in the sequence shown in Fig. 3.20. Torque tighten the screws in the sequence shown on Fig. 3.22 to 1.0 Nm.**

Note: The latest type clamp plate has an identification mark (•) as illustrated in Fig 3 22

6. Fit the latest type clamp plate (20) over the sight glass (23) and secure the complete assembly with six screws (22) illustrated on Fig. 3 34. Torque tighten to 1.0 Nm.

7. Fit the lever (165) to the stem of the valve drive (162). Fit one screw (166) to a disc spring (167) and secure the lever in position. Torque tighten to 1 Nm.

[illegible]

3.9 Checking The Depth Of The Actuator Spindles (Fig. 3.24)

4. If either actuator spindle depth indication is not 9 ± 0.2 mm in either test, release the locknut (61) and adjust the incorrect spindle depth to 9 ± 0.2 mm.

5. Torque tighten the spindle locknuts (61) to 1.0 Nm and repeat the procedure until a satisfactory result is obtained.

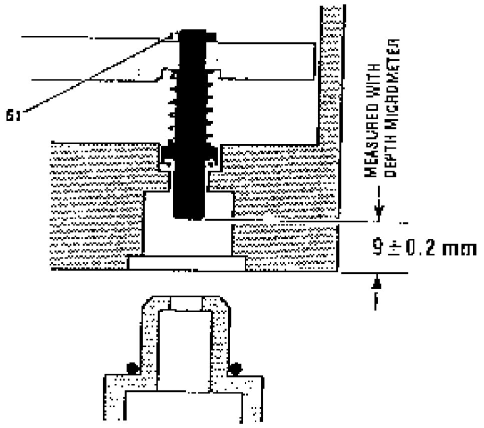


Fig. 3.24 Checking The Depth Of The Actuator Spindles

3.10 Tactile Tests

3.10.1 Checking Correct Functioning Of Interlock System

1. Check that the vaporizer locks onto the 2 position or 3 position manifold.

2. Mount the vaporizer on a manifold alongside either a Tec 4 or Tec 5 reserve vaporizer. Turn on the reserve vaporizer and ensure that the vaporizer on test cannot be turned on. Turn off the reserve vaporizer, turn on the vaporizer on test and ensure that the reserve vaporizer cannot be turned on. Turn off the vaporizer on test, interchange the vaporizers and repeat the test.

3. Unlock the vaporizer and ensure that the locking lever springs to the up position when unlocked. Remove the vaporizer from the manifold.

3.10.2 Checking Interface Between Dial And Interlock

1. Press one of the interlock rods fully into the interlock block and then release it. Check that the rod returns to its original, centralised position immediately the pressure is released. Repeat this operation on the other interlock rod.

2. With the control dial set to the OFF condition, pull in the dial release as far as possible and hold it in this position.

3. Attempt to rotate the control dial, first in a clockwise direction and then in a counter-clockwise direction. It must not be possible to rotate the dial beyond the OFF condition.

4. Release the pressure on the dial release and check that it is returned by spring pressure to the fully extended position

5. Depress the vaporizer locking lever, hold it in the depressed position and turn it clockwise through 90 degrees to the locked position. Release the lever and check that it immediately returns to the original, unlocked position

6 Depress the vaporizer locking lever, hold it in the depressed position, turn it clockwise through 90 degrees to the locked position and hold it in this position.

7. Pull in the control dial release as far as possible and rotate the dial slowly in a counter-clockwise direction from the OFF condition to its maximum limit of rotation and then release the dial release.

8. Rotate the dial back again to the OFF condition without holding the dial release. Check that there are no tight or stiff spots at any point during rotation in either direction and that the dial release springs out to its original locked position immediately the OFF condition is attained.

9 Release the vaporizer locking lever and check that it springs back to its original, unlocked position. Record the results on test sheet 1 of 4.

3.11 Leak Testing

Note: The vaporizer wicks must be dry for the following test

Note: The flow control valve on the 1 to 10 litre/minute flowmeter, Part No 84017, must be fully open for the duration of the tests.

3.11.1 Leak Test At ON (Fig. 3.25)

1 Fully close the shut off valve to the reservoir and turn the vaporizer dial to 3%

2 Adjust the pressure to 200 mm Hg.

3 Allow the mercury to stabilise and readjust if necessary

4. Measure and record the pressure drop on test sheet 1 of 4 after 30 seconds. The maximum allowed pressure drop is 4 mm Hg.

6. Turn the vaporizer dial to the OFF position

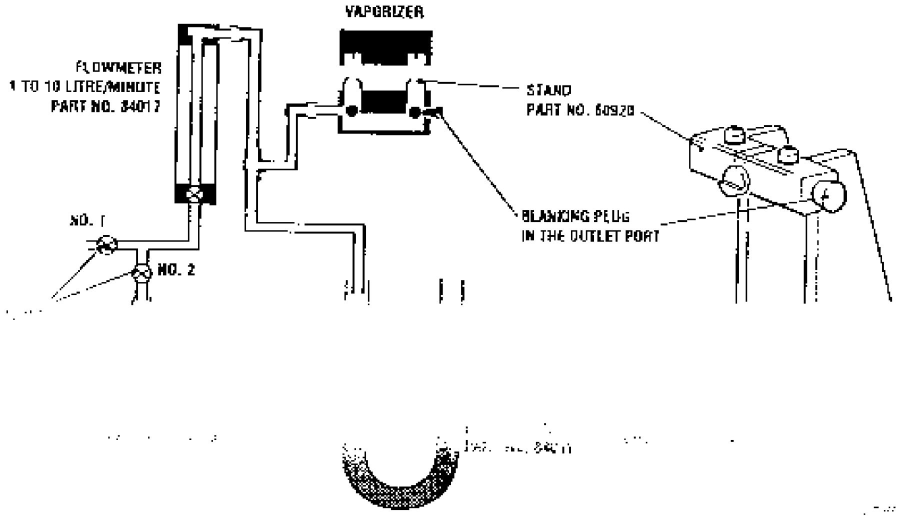


Fig. 3.25 Leak Test At ON

3.11.2 Vent Test

click, to the OFF position. Turn the vaporizer control dial ON slowly, click-by-click to approximately the midway position, again observing the manometer. Record on the test sheet the lowest value obtained.

Tolerance: This indicated pressure must not decrease below 120 mm Hg and must not decrease by more than 3 mm Hg over a 30 second period from the time of reaching the midway position stipulated in Instruction 3.

4. Disconnect the vaporizer from the test circuit and record the result of the test on test sheet 1 of 4. Open the filler mechanism slightly to release any pressure trapped in the sump. Close the filler mechanism after the pressure has been released.

5. Remove the blanking plug from the outlet port of the stand.

3.12 Filling The Vaporizer

⚠ **Warning: Do not fill the vaporizer with any anaesthetic agent other than the one specified for that vaporizer. The vaporizer is designed for that agent only. Any agent other than that specified can prove to be dangerous to a patient.**

⚠ **Warning: Do not fill the vaporizer unless the vaporizer dial is in the OFF position.**

⚠ **Warning: Do not turn the dial during filling.**

3.12.1 Screw Cap Filler

1. Pour approximately 200 cc of the appropriate anaesthetic agent into the screw filler

2. Top up the vaporizer after 20 minutes.

3.12.2 Keyed Filler

1 Use the clamp screw securing tool Part No 2202-8021-000 to operate the clamp screw

2. Fill the vaporizer with the correct anaesthetic agent until the agent is visible in the sight glass and bubbles stop entering the bottle

3 Top up the vaporizer after 20 minutes

3.13 Sump And Thermostat Servicing And Test Procedure

The following procedure must only be performed if the vaporizer fails the sump and thermostat pressure test described in Section 3 7 1 Thermostat Test.

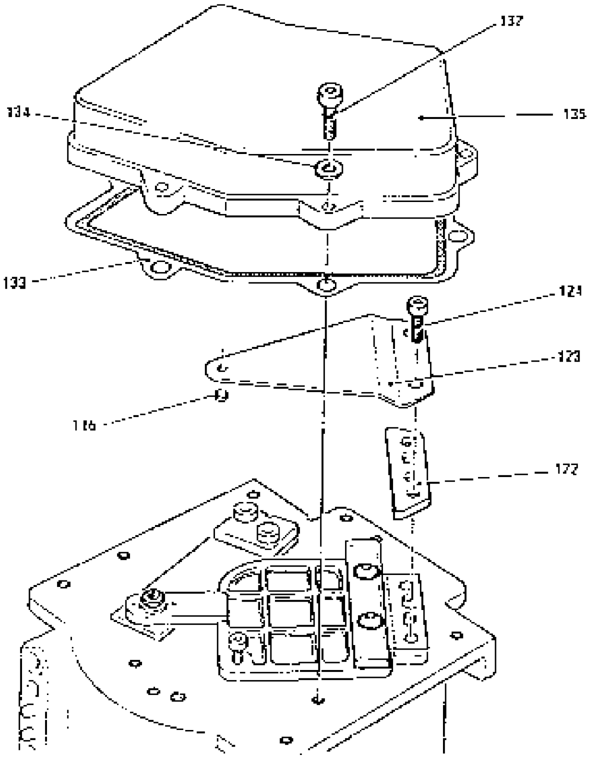
⚠ **Caution: The flapper and boss are a matched pair for thickness and must be retained as a matched pair.**

3.13.1 Thermostat Disassembly (Fig. 3.26, 3.27 And 3.28)

1. Remove the six screws (132) and washers (135) which secure the thermostat cover, remove the plastic thermostat cover (135) and gasket (133) Dispose of the gasket

2. Without losing the jewelled bearing (116), which is held in position only by spring pressure, remove the two screws (124) which secure the triangular thermostat spring and then carefully remove the thermostat spring and jewelled bearing

3. Retain the jewelled bearing and dispose of the thermostat spring and then lift off the hinge plate body (122).



4. Remove the two hinge plate flapper securing screws (118). Lift off the hinge plate flapper (117), hinge strip (129), flapper and boss (130) and the shim (120) from the [illegible]

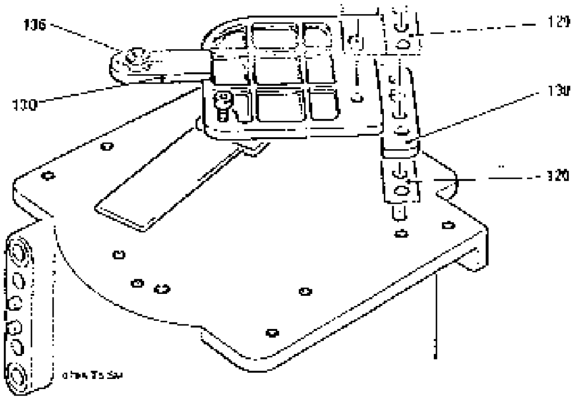

136
130
129
130
120

Fig. 3.27 Thermostat Flapper And Boss Disassembly

5. Remove the two clamp securing screws (128), the two bi-metal clamps (126) and the bi-metal strip (127) from the sump base.

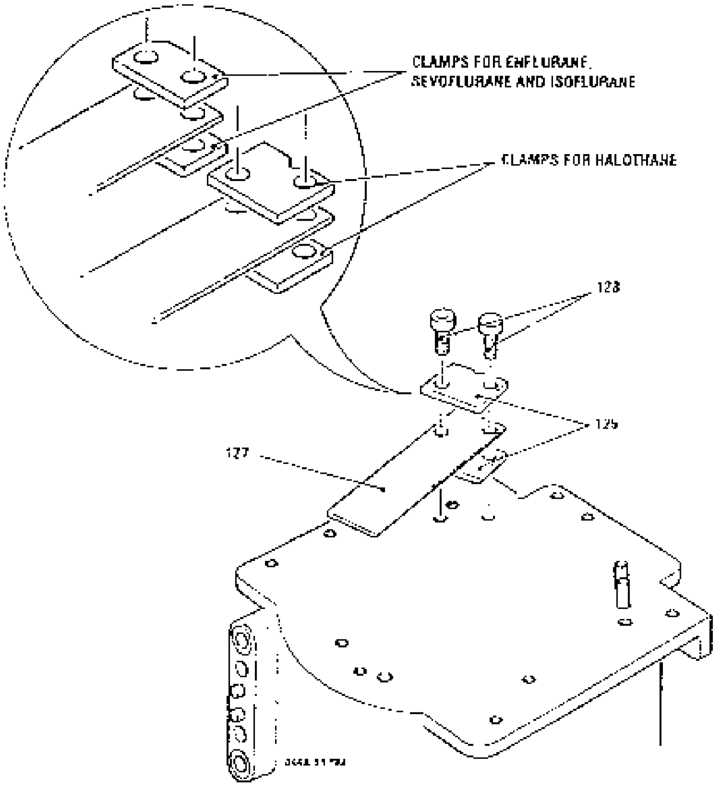

CLAMPS FOR ENFLURANE,
SEVOFLURANE AND ISOFLURANE
CLAMPS FOR HALOTHANE
128
126
127

Fig. 3.28 Thermostat Bi-metal Strip Disassembly

3.13.2 Cleaning

3.13.2.1 Hand Cleaning Of Components.

⚠ **Caution: When cleaning plastic components, a cold cleaning agent must be used. If a hot cleaning agent is used, there is the possibility of component distortion.**

The jewelled bearing (116) and setting screw (136) must be hand-cleaned using a cold cleaning agent such as Genklene, Trilene, Freon TF or an equivalent solvent which has been approved by Ohmeda Steeton.

3.13.3 Reassembly (Fig. 3.29 To 3.33)

⚠ **Caution: The flapper and boss are a matched pair for thickness and must be retained as a matched pair.**

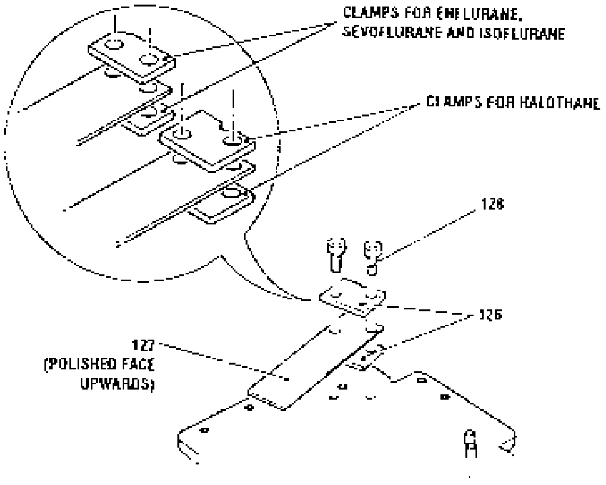
⚠ **Caution: After cleaning, ensure that all components are scratch-free and are not damaged.**

Note. Any new thermostat components supplied by Ohmeda have been stress relieved where necessary.

1 Place one agent specific bi-metal clamp (126) in position on the sump base as illustrated on Fig. 3.29.

2. Place a agent specific bi-metal strip (127) on top of the clamp, ensuring that the polished face of the bi-metal strip is facing upwards

3 Fit another agent specific bi-metal clamp (126) on top of the bi-metal strip and fit the assembly loosely to the sump base using the clamp securing screws (128)


CLAMPS FOR ENFLURANE, SEVOFLURANE AND ISOFLURANE
CLAMPS FOR HALOTHANE
128
126
127 (POLISHED FACE UPWARDS)

Note: If the setting screw (136) and stop screw (137) are fitted, ensure that they are unscrewed sufficiently not to interfere with the fixture.

4 Position the thermostat boss (130) on to the dowels of the alignment fixture Part No 2802-8007-000 and manoeuvre its matched thermostat flapper (117) into the alignment fixture against the spring pressure, as illustrated on Fig. 3.30

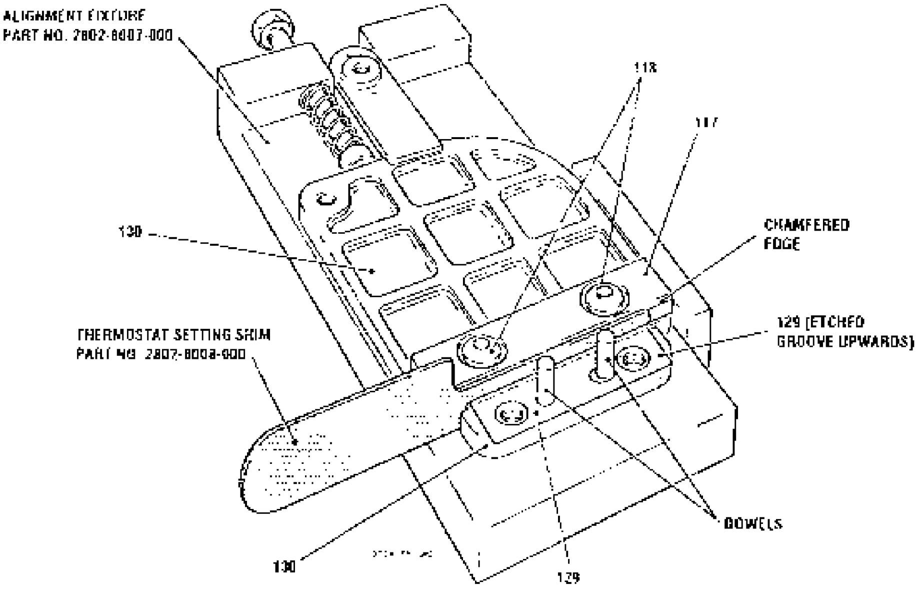

ALIGNMENT FIXTURE
PART NO. 2802-8007-000
118
117
130
CHAMFERED
EDGE
THERMOSTAT SETTING SHIM
PART NO 2802-8008-000
129 (ETCHED
GROOVE UPWARDS)
DOWELS
130
129

Fig. 3.30 Setting The Hinge Gap

5. Position the hinge strip (129) on to the dowels over the thermostat flapper and boss ensuring that the etched groove in the hinge strip is facing upwards

6 Position the hinge plate flapper (117) on to the hinge strip with the chamfered edge of the hinge plate flapper adjacent to the dowels as illustrated in Fig. 3.30 and loosely fit the hinge plate flapper securing screws (118)

7 Pull the thermostat flapper against the spring pressure of the assembly fixture spring and insert the 0.5 mm thermostat setting shim Part No 2802-8008-000 between the thermostat boss and flapper matched pair.

8. Release the thermostat flapper and torque tighten the hinge plate flapper securing screws (118) to 2.0 Nm using tool Part No 2802-8053-000. Remove the thermostat

10. Fit the thermostat shim (120) over the two dowel pins in the sump base, then fit the boss (130) over the dowel pins on top of the shim as illustrated in Fig. 3.31.

11. Fit the hinge strip (129) of the hinge plate flapper, thermostat flapper and hinge strip assembly over the dowel pins, with the hinge strip (129) on top of the thermostat boss assembly.

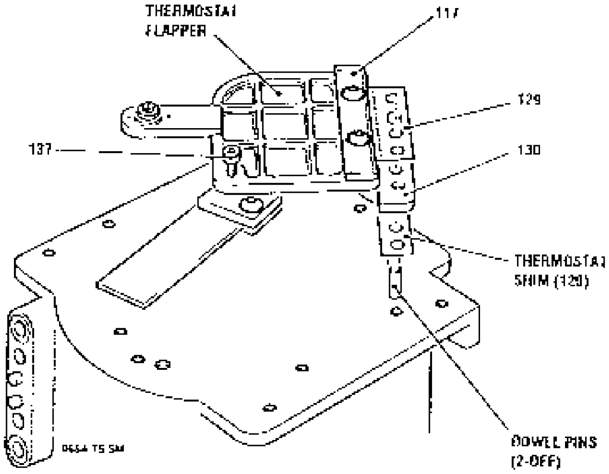
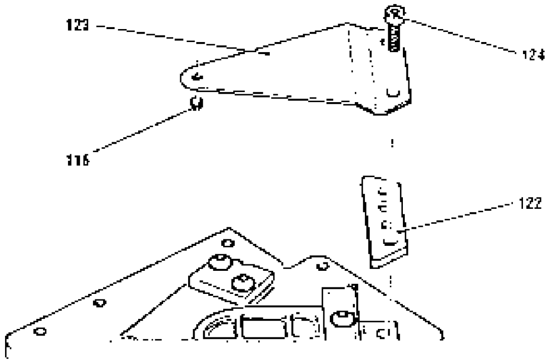


Fig. 3.31 Hinge Plate Flapper And Boss Reassembly

12. Fit the hinge plate body (122) over the dowel pins on top of the hinge strip, ensuring that its longer edge is adjacent to the hinge plate flapper, as illustrated in Fig. 3.32.

13. Fit the jewelled bearing (116) into the hole in the tip of a new thermostat spring (123). Hold the jewelled bearing in position, fit the spring and bearing onto the hinge plate body (122) and then fit the two thermostat spring securing screws (124) loosely through the complete assembly into the sump base.



14. Insert the thermostat setting shim Part No. 2802-8008-000 illustrated in Fig. 3.33.

15. Fit the thermostat effective length setting fixture, either Part No 2802-8005-000 or 2802-8006-000 as applicable, onto the thermostat flapper so that the two pins in the fixture fit into the holes in the thermostat flapper, as illustrated in Fig 3.33.

16. Set the effective length by pushing the head of the setting fixture in the direction shown.

17. Ensure that the two bi-metal clamps (126) are square to each other, then torque tighten the securing screws (128) to 2.0 Nm using tool Part No 2802-8053-000

18. Torque tighten the thermostat spring assembly securing screws (124) to 2.0 Nm using tool Part No 2802-8053-000.

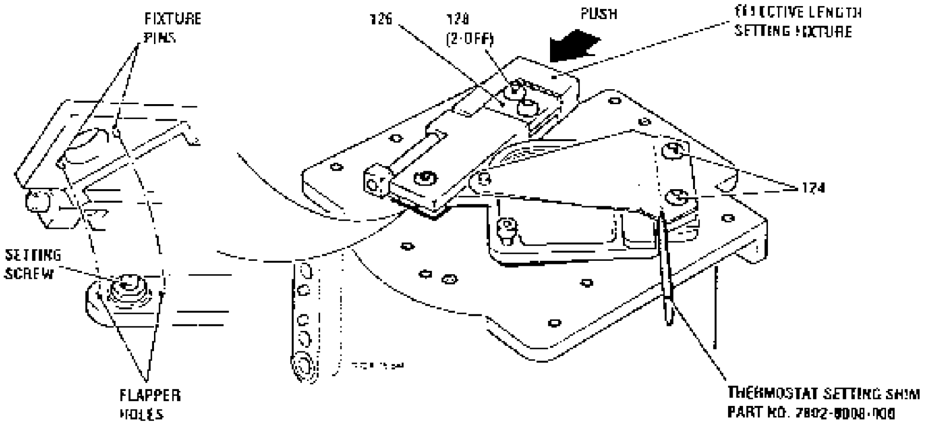

FIXTURE PINS
126
128 (2-OFF)
PUSH
EFFECTIVE LENGTH SETTING FIXTURE
124
SETTING SCREW
FLAPPER HOLES
THERMOSTAT SETTING SHIM PART NO. 2802-8008-000

Fig. 3.33 Setting The Effective Length

19. Remove the effective length gauge and the thermostat setting shim.

20. Before proceeding to instruction 21, check the following

a) The hinge gap between the thermostat flapper and the boss must be 0.5 ± 0.1 mm. Check with feeler gauges as follows.

Go = 0.4 mm **No Go = 0.6 mm**

b) Ensure that with both the setting screw and the stop screw retracted, the flapper is not touching the bi-metal strip. If there is contact between these two components it is an indication that one or both components is distorted. A distorted component must be removed and disposed of and a new flapper and boss and/or bi-metal strip must be fitted.

3.13.4 Thermostat Setting (Fig. 3.34 And 3.35)

Note: Record the setting results on the Thermostat Setting Sheet 1 of 1.

Before commencing the thermostat setting procedure, the assembly must stand in a temperature controlled room for a minimum of three hours at a temperature of 22 ± 1 deg. C

Set up the test circuit as illustrated in Fig. 3.34. Ensure that the water manometer is reading zero at 5 litres/minute medical air flow with the thermostat out of circuit

The temperature of the test air must be 22 ± 1 deg. C.

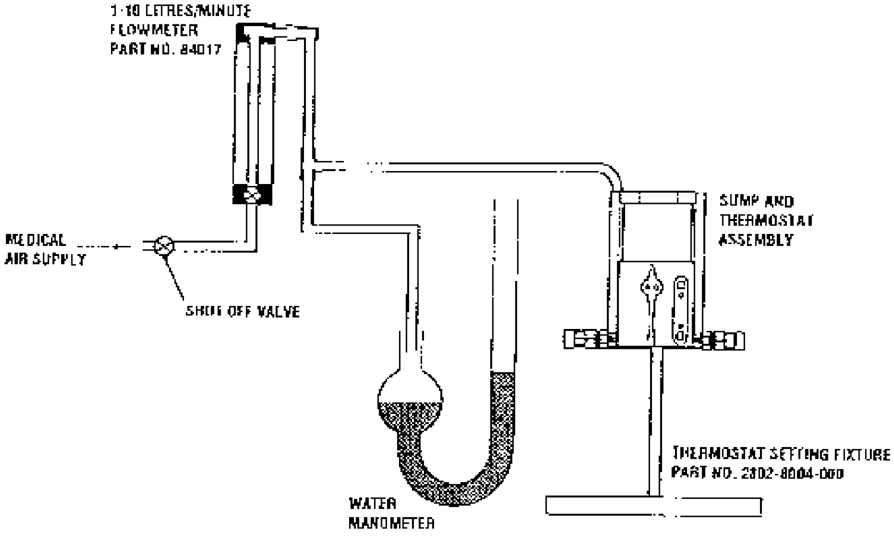

1-10 LITRES/MINUTE
FLOWMETER
PART NO. 84017
MEDICAL
AIR SUPPLY
SHUT OFF VALVE
SUMP AND
THERMOSTAT
ASSEMBLY
THERMOSTAT SETTING FIXTURE
PART NO. 2802-8004-000
WATER
MANOMETER

Fig. 3.34 Thermostat Pressure Test Circuit

3.13.4.1 Setting The Thermostat Stop Screw

1. Ensure that the type of sump and thermostat assembly are marked with the initials for the anaesthetic agent for which they are designed, as follows

   E/I/S for Enflurane, Isoflurane and Sevoflurane vaporizers
   HAL for Halothane vaporizers

⚠ **Caution: Ensure that the thermostat adjusting screw is not in contact with the bi-metal strip prior to setting.**

3. Observe the manometer and adjust the thermostat stop screw illustrated on Fig. 3.35 until the correct nominal pressure of 227 +0 -10 mm H_2O is indicated.

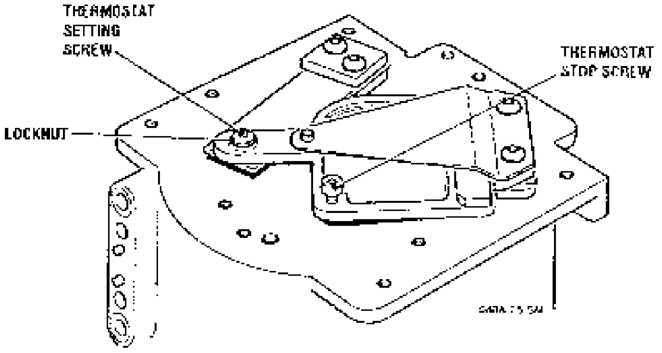


Fig. 3.35 Thermostat Stop Screw And Adjusting Screw Adjustment

3.13.4.2 General Setting

1. Connect a 5 litres/minute medical air flow to the sump and thermostat assembly.

2. Record the ambient temperature. To monitor the temperature stability, it is permissible to utilise electronic chart recording of temperatures of the test area to ensure that the ambient temperature required for testing is maintained during the time specified prior to commencement of vaporizer testing

3. Set the thermostat by adjusting the adjusting screw to attain the relevant pressure setting specified in Table 1. Hold the adjusting screw firmly at this setting and torque tighten the adjusting screw locknut to 1.4 Nm using Tool Part No. 2802-8063-000 fitted with an 8mm A/F socket . The tolerance allowed is ± 3 mm H_2O of the pressure setting specified in Table 1.

Note: The closer the reading is to the pressure setting specified in Table 1, the greater the possibility is of the thermostat passing the test.

Halothane Thermostats		Enf., Iso. And Sevo. Thermostats	
Temperature deg. C	Pressure Setting mm H_2O	Temperature deg. C	Pressure Setting mm H_2O
21.0	106	21.0	107
21.2	105	21.2	105
21.4	103	21.4	104
21.6	102	21.6	102
23.0	95	23.0	

Table 1. Thermostat Setting

4. Remove the hand tools, recheck the reading and readjust if necessary to achieve the specified tolerance. Record the manometer reading as Setting A.

5. Disconnect the air supply for approximately 3 seconds, reconnect and then record the reading as Setting B. Check that the thermostat remains within ± 3 mm H_2O of the values provided in Table 1

6. If the reading is out of tolerance, reset the thermostat and repeat the test. A maximum of four attempts can be made to obtain the correct pressure reading.

7. Complete Section 3.11.4.3 Stability immediately after 3.11.4.2 Setting.

3.13.4.3 Stability

1. Use the thermostat stability tool Part No. 2802-8028-000 to push thermostat flapper until the pressure increases to 200 mm H_2O, release after 1 second and record the reading. The reading must be within ± 5 mm H_2O of Setting B.

2. Use the thermostat stability tool Part No. 2802-8028-000 to pull the flapper open until the thermostat adjusting screw is just clear of the bi-metal strip. Release after 1 second allow the manometer to stabilise and then record the reading. The reading must be within ± 5 mm H_2O of the reading recorded as Setting B.

3. If a failure occurs during the stability test, it is permissible to reset the thermostat and repeat the stability test once only.

4. Fit the thermostat cover temporarily using only two screws.

3.13.4.4 Cycling

1. Place the sump and thermostat assembly in an oven and cycle 4 times as follows:

    a) Increase the temperature from room temperature to 35 deg. C. and allow the assembly to soak at 35 deg. C for one hour

    b) Either force cool the assembly to 22 ± 1 deg. C or allow it to cool naturally to 22 ± 1 deg. C and maintain it at this temperature for one hour

    c) Repeat the procedure described in Instructions a) and b) three more times but after the assembly attains a temperature of 22 ± 1 deg. C for the fourth time, proceed with Instruction 2.

2. Transfer the sump and thermostat assembly to a temperature controlled test room and allow it to stand for a minimum of 2 hours at a temperature of 22 ± 1 deg. C before commencing the final check, as follows:

3.13.4.5 Final Check

[illegible]

Remove the two screws and remove [illegible]

2. Connect an air flow of 5 litres/minute to the sump and thermostat assembly.

3. Record the temperature of the sump by attaching a thermometer to the sump assembly

4. Check the manometer reading and record the reading as Setting C. The indicated pressure must be within ±3 mm H_2O of the values given in Table 1.

5. Allow the thermostat to stand for a minimum of 12 hours and then check the resistance against the values provided in Table 1. The values must be within ±3 mm H_2O of the values given in Table 1. Record the reading as Setting D.

6. When the thermostat has passed the tests, fit a new gasket and thermostat cover to the sump base.

7 Fit the six securing screws and washers and use tool Part No. 2802-8053-000 to torque tighten the screws to 2.0 Nm in the sequence illustrated in Fig. 3.36.

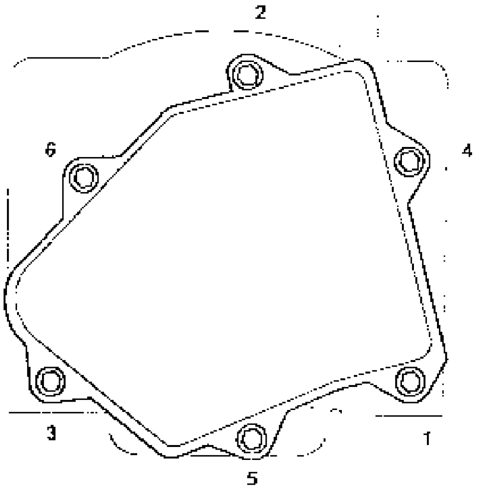


Fig. 3.36 Thermostat Cover Torque Tightening Sequence

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Section 4.0

Accuracy Tests

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4.4 35 Deg. C Temperature Test ... 5
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4.1 Test Criteria

4.1.1 General

Test procedures are only valid for the conditions specified.

The test temperature for all tests in this section except the 35 deg C Temperature Test, must be 21 ± 2 deg. C.

Note: A room temperature test must be carried out after the 35 deg. C Test.

The vaporizer sump must contain sufficient agent for the checks to be performed. The level of agent must be at or above the level of the two middle screws of the six screws which secure the sight glass

The normal test circuit illustrated on Fig. 4.1 with a 450 to 500 cc/minute vacuum flow to the refractometer must be used for each test.

For temperature monitoring purposes, it is permissible to utilise electronic chart recording equipment within the test area. This is to help ensure that the ambient temperature required for testing is maintained during the time specified prior to commencement of testing.

If the test temperature departs from the specified limits, testing must cease until the temperature is restored to within the specified limits for a sufficient period of time to ensure temperature stability within the vaporizer.

If necessary, the effect of the vaporizer being initially charged with air and subsequently being tested with oxygen as the test gas must be overcome, as follows:

1. If there is documentary evidence that the vaporizer has been tested within the previous 75 hours, it can be assumed that the sump is filled with oxygen and testing can commence immediately.
2. If there is no such documentary evidence then the sump must be charged with oxygen using either a conventional test stand, Tool Part No TE1-001, or an optional mass purging rig, Tool Part No. TE103, as described in the following Instructions 3 and 4.
3. Purge the vaporizer by passing a 5 litres/minute flow of oxygen through the vaporizer for three minutes with the dial set at maximum.
4. Turn off the dial before turning off the oxygen to hold the oxygen in the sump.

4.1.2 Temperature Stabilisation

After filling the vaporizer with agent, a minimum of 10 minutes must be allowed to elapse [illegible]

When using conventional test stand Tool Part No. TE1-001 to purge the vaporizer, a minimum of 20 minutes must be allowed to elapse between completing the purging procedure and commencing the testing procedure.

The preceding times are applicable only if the agent has been previously stored as follows:

Container	Storage Time	Temperature
100 millilitre bottle	90 minutes	21 ± 2 deg. C
250 millilitre bottle	3 hours	21 ± 2 deg. C
25 litre drum	12 hours	21 ± 2 deg. C

Note: Test results for 4.2 must be recorded on test sheet 2 of 4. The test results for 4.2, 4.3, 4.4, and 4.5 must be recorded on test sheet 3 of 4.

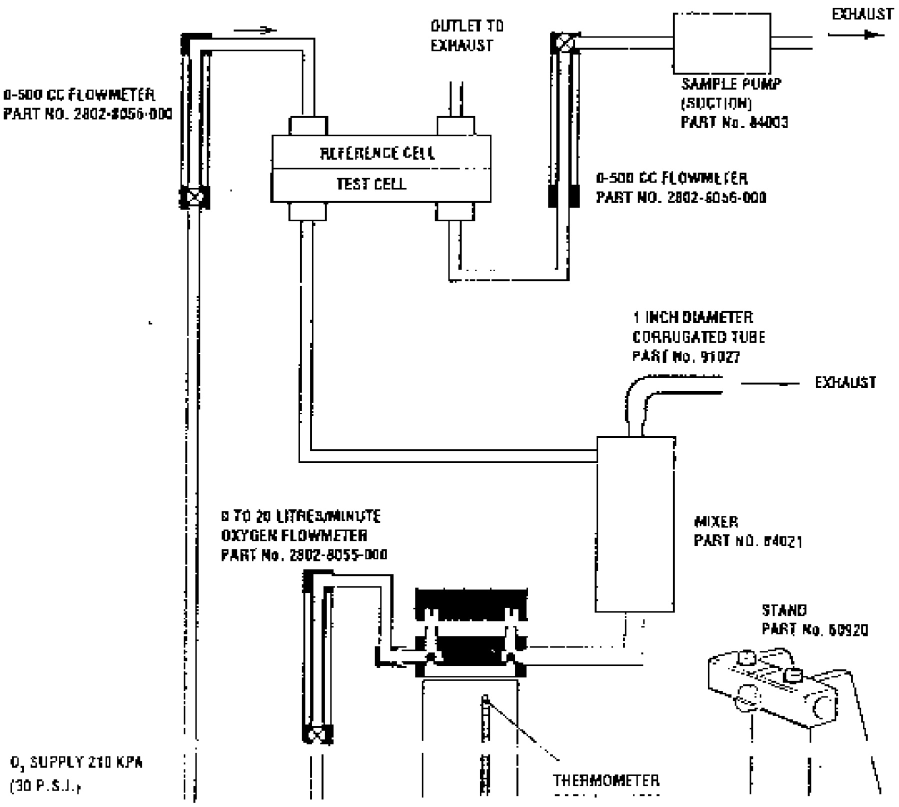
0-500 CC FLOWMETER
PART NO. 2802-8056-000
OUTLET TO
EXHAUST
EXHAUST
SAMPLE PUMP
(SUCTION)
PART No. 84003
REFERENCE CELL
TEST CELL
0-500 CC FLOWMETER
PART NO. 2802-8056-000
1 INCH DIAMETER
CORRUGATED TUBE
PART No. 91027
EXHAUST
MIXER
PART NO. 84021
0 TO 20 LITRES/MINUTE
OXYGEN FLOWMETER
PART No. 2802-8055-000
STAND
PART No. 60920
O_2 SUPPLY 210 KPA
(30 P.S.I.)
THERMOMETER

Fig. 4.1 Testing Circuit Arrangement

4.1.3 Adjustment Criteria

It is essential that if a vaporizer is out of tolerance at any stage during the test procedure, the appropriate adjustments must be made. After adjustment the complete test cycle must be repeated, applying the following criteria:

1. If the retest immediately follows the 35 Deg. C Temperature Test, a minimum of 6 hours must be allowed to elapse before commencing the retest.
2. If the retest immediately follows the 10 Litres/Minute or 15 Litres/Minute Flow Test, a minimum of 40 minutes must be allowed to elapse before commencing the retest.
3. If the retest immediately follows either the 1.0 Litre/Minute Flow Test or the Calibration Check, a minimum of 10 minutes must be allowed to elapse before commencing the retest.

4.2 Calibration Check

4.2.1 Procedure

1. With the vaporizer out of circuit pass a 5 litres/minute flow of oxygen through the test circuit for 30 seconds, align the fringes and record the refractometer reading. This reading is the refractometer zero which must be either added to or subtracted from subsequent micrometer readings.
2. Connect the vaporizer into the test circuit and set flow of 5 litres/minute oxygen Record details of the time, date and temperature.
3. Turn the vaporizer control dial to the 0% mark and align the fringes.
4. Check the reading after 30 seconds and if it is 0.08% or less, turn the dial to the 0.2% mark and record the reading. If the reading is greater than 0.08%, allow an additional 30 seconds (a total of 60 seconds from the commencement of the test) and then record the reading and turn the dial to the 0.2% mark.
5. Align the fringes and after 30 seconds turn the dial to the 0.6% mark and record the previous refractometer reading.
6. Repeat the procedure for dial marks 1%, 2%, 3%, 4% and 5% (plus 6%,7% & 8% if applicable) so that a series of readings at 30 second intervals is obtained.

4.2.2 Tolerances

The output of the vaporizer at each nominated dial mark must be in accordance with the following tolerance table. If the output is not within the specified tolerances, refer to Section 5.0 Calibration.

Hal., Enf. And Iso.		
[illegible]	[illegible]	[illegible]
4.0	3.60	4.40
5.0	4.50	5.50

Sevo. 5% And 8%		
[illegible]	[illegible]	[illegible]
4.0	[illegible]	[illegible]
5.0	4.70	[illegible]
6.0	5.40	6.60
7.0	6.35	7.70
8.0	7.20	8.80

4.3 15 Litres/Minute Flow Test

Before proceeding with the 15 Litre/Minute Flow Test allow the vaporizer to stand for a minimum of 10 minutes at a temperature of 21 ± 2 deg. C.

4.3.1 Procedure

1. With the vaporizer out of circuit pass a 15 litres/minute flow of oxygen through the test circuit for 30 seconds, align the fringes and record the refractometer reading. This reading is the refractometer zero which must be either added to or subtracted from subsequent micrometer readings.

2. Connect the vaporizer into circuit on stand Part No. 60920 and turn the vaporizer dial to the 0.2% mark.

3. Align the fringes and after 30 seconds turn the dial to the 0.6% mark. Record the previous refractometer reading.

4. Repeat the procedure for dial marks 1%, 2%, 3%, 4% and 5% (plus 6%,7% & 8% if applicable) so that a series of readings at 30 second intervals is obtained.

4.3.2 Tolerances

The output of the vaporizer at each nominated dial mark must be in accordance with the following table:

Hal., Enf. And Iso.		
Dial	Min.	Max.
0.2	0.10	0.30
0.6	0.50	0.70
1.0	0.90	1.10
2.0	1.70	2.30
3.0	2.60	3.40
4.0	3.40	4.60
5.0	4.10	5.45

Sevo. 5% And 8%		
Dial	Min.	Max.
0.2	0.10	0.30
0.6	0.50	0.75
1.0	0.90	1.15
2.0	1.70	2.30
3.0	2.60	3.40
4.0	3.40	4.60
5.0	3.80	5.45
6.0	3.90	6.60
7.0	4.20	7.70
8.0	4.40	8.80

4.4 35 Deg. C Temperature Test

Before commencing the 35 deg. C temperature test the vaporizer must be prepared for testing by one of the following methods:

4.4.1 Preparation - Method 1

1. Place the vaporizer into a preheating oven for a minimum period of 1 hour with the oven set at 35 deg. C. Then transfer the vaporizer into a hot box and mount it on a test stand.

2. Allow the vaporizer to remain in the hot box at a controlled temperature of 35 ± 1 deg. C for a minimum period of 1 hour and then continue with the test procedure.

4.4.2 Preparation - Method 2

1. Place the vaporizer in an oven set at a controlled temperature of 35 ± 1 deg. C. Then allow for a minimum period of 3 hours to elapse to ensure that the vaporizer attains temperature of 35 ± 1 deg. C.

2. Transfer the vaporizer to a hot box, mount it on a test stand and continue with the test procedure ensuring that the vaporizer temperature is controlled at 35 ± 1 deg. C for the duration of the test.

3. Do not remove the vaporizer from the hot box until the test is completed

4.4.3 Procedure

1 With the vaporizer out of circuit pass a 5 litres/minute flow of oxygen through the test circuit for 30 seconds, align the fringes and record the refractometer reading. This reading is the refractometer zero which must be either added to or subtracted from subsequent micrometer readings.

2. Connect the vaporizer into the test circuit without removing the vaporizer from the hot box and then turn the dial to the 0.2% mark. Align the fringes and after 60 seconds turn the dial to the 0.6% mark. Record the previous refractometer reading.

3. Align the fringes and after 30 seconds, turn the dial to 1%, record the previous reading.

4 Repeat the procedure described in instruction 3 for 2%, 3%, 4% and 5% (plus 6%,7% & 8% if applicable) respectively, ensuring that the readings are taken after 30 seconds before turning the dial to the next dial mark.

4.4.4 Tolerances

The output of the vaporizer at each nominated dial mark must be in accordance with the following table:

[illegible]		
[illegible]	[illegible]	[illegible]
5.0	4.30	5.70

[illegible]		
[illegible]	[illegible]	[illegible]
5.0	[illegible]	[illegible]
6.0	5.40	7.80
7.0	6.30	9.10
8.0	7.20	10.40

4.5 1.0 Litre/Minute Flow Test

Before proceeding with the 1.0 Litre/Minute Flow Test, store the vaporizer for a minimum of 6 hours at a temperature of 21 ± 2 deg. C.

4.5.1 Procedure

1. With the vaporizer out of circuit, pass a 1 litre/minute flow of oxygen through the circuit for 45 seconds, align the fringes and record the refractometer reading. This reading is the refractometer zero which must be either added to or subtracted from subsequent micrometer readings.
2. Connect the vaporizer into circuit on stand Part No. 60920. Turn the dial to the 0.2% mark.
3. Align the fringes and after 45 seconds turn the dial to the 0.6 % mark. Record the previous refractometer reading.
4. Repeat the procedure for dial marks 1%, 2%, 3%, 4% and 5% (plus 6%.7% & 8% if applicable) so that a series of readings at 45 second intervals is obtained.

4.5.2 Tolerances

The output of the vaporizer at each nominated dial mark must be in accordance with the following table:

Hal., Enf. And Iso.		
Dial	**Min.**	**Max.**
0.2	0.10	0.30
0.6	0.50	0.70
1.0	0.85	1.15
2.0	1.70	2.30
3.0	2.60	3.40
4.0	3.40	4.60
5.0	4.30	5.70

Sevo. 5% And 8%		
Dial	**Min.**	**Max.**
0.2	0.10	0.30
0.6	0.50	0.70
1.0	0.85	1.15
2.0	1.70	2.30
3.0	2.60	3.40
4.0	3.40	4.60
5.0	4.30	5.85
6.0	5.40	7.20
7.0	6.30	8.40
8.0	7.20	9.60

Section 5.0

Calibration

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[illegible]	[illegible]	

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5.1 Calibration Criteria

If a vaporizer fails to meet the tolerances specified in Section 4.0 Accuracy Tests, the vaporizer output must be adjusted by fitting a new dial strip. The graduations on the dial strip can be matched with the output of the vaporizer.

The results of the calibration procedure must be recorded on Test Sheet 2 of 4

After completing the calibration procedure, the tests detailed in Section 4.0 Accuracy Tests must be repeated in order to verify that the vaporizer output is now within the specified tolerances.

In order to allow the vaporizer time to warm up following the cooling effect created by the time taken to fit the dial strip, a minimum of 10 minutes must be allowed to elapse before repeating the calibration and flow tests

5.2 Removing The Dial Strip (Fig. 5.1)

1. Transfer the vaporizer with its base support and test sheet to the work bench, ensuring that the vaporizer identification number corresponds with the number on the test sheet

2. Remove the two screws which secure the dial to the disc drive and remove the dial and dial release mechanism assembly free from the vaporizer

3 Remove the dial release, the two springs, the OFF indicator and the graduated dial strip from the dial assembly. Note on Test Sheet 2 of 4 which type of dial strip. E0/S0, E+/S+ or E-/S- for Ethrane vaporizers, or H/I0, H/I+, H/I-, H/I0 DOT or H/I- DOT for Halothane and Isoflurane vaporizers, is removed from the dial

4 Position the 'L' shape of the stop moulding removal tool Part No. 2802-8026-000 under the bottom face of the stop moulding and lift the tool upwards to remove the stop moulding from the top plate.

5. Reassemble the dial springs and dial release to the dial and fit the dial assembly to the vaporizer with the two screws. Do not fit a dial strip and the 'OFF' indicator to the dial or the stop moulding to the top plate at this stage

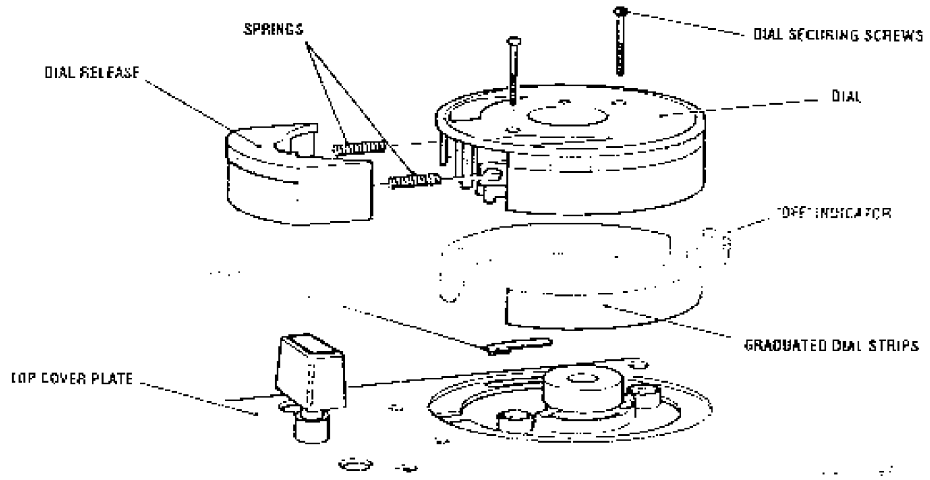

Fig. 5.1 Dial Strip And Stop Moulding Removal

5.3 Preparing The Vaporizer (Fig. 5.2)

1. If there is documentary evidence that the vaporizer has been tested within the previous 75 hours, it can be assumed that the sump is filled with oxygen and testing can commence immediately.

2. If there is no such documentary evidence, pass a flow of 5 litres/minute of oxygen through the vaporizer for 3 minutes at maximum dial setting. After purging, allow a minimum of 10 minutes to elapse before commencing the calibration procedure. Refer to Section 4.1, Test Criteria.

3. Set up the test equipment as shown in Fig. 5.2, turn the vaporizer dial to the OFF position and connect the vaporizer into the circuit.

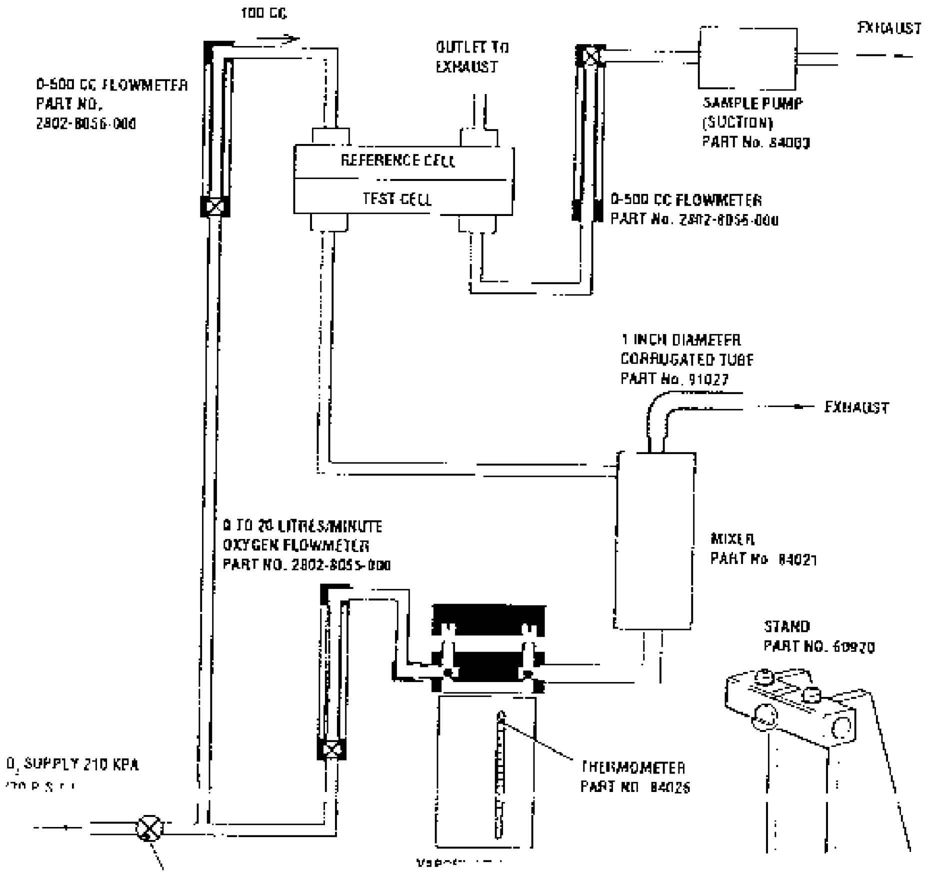
100 CC
0-500 CC FLOWMETER
PART NO.
2802-8056-000
OUTLET TO
EXHAUST
EXHAUST
SAMPLE PUMP
(SUCTION)
PART No. 84003
REFERENCE CELL
TEST CELL
0-500 CC FLOWMETER
PART No. 2802-8056-000
1 INCH DIAMETER
CORRUGATED TUBE
PART No. 91027
EXHAUST
0 TO 20 LITRES/MINUTE
OXYGEN FLOWMETER
PART NO. 2802-8055-000
MIXER
PART No. 84021
STAND
PART NO. 60970
O_2 SUPPLY 210 KPA
(30 P.S.I.)
THERMOMETER
PART NO. 84026
Vaporizer

Fig. 5.2 Testing Circuit Arrangement

5.4 Selecting The Dial Strip

1. Examine the results of the test in Section 4.0 to establish in which respect the vaporizer output did not meet the required tolerance

2. If the output of the vaporizer is greater than 3.3% at dial setting 3, 4.4% at dial setting 4 or 5.5% at dial setting 5, complete Instructions 3 and 4. If the output of the vaporizer is less than 2.7% at dial setting 3, 3.6% at dial setting 4 or 4.5% at dial setting 5, complete Instructions 5 and 6.

3. If a - (minus) strip was removed, fit a 0 (normal) dial strip. If a 0 (normal) dial strip was removed, fit a + (plus) dial strip. If a + (plus) strip was removed, rectification is required.

4. If the vaporizer output does not meet the required tolerance after a 0 (normal) dial strip is fitted, fit a + (plus) dial strip. If the vaporizer output does not meet the required tolerance after a + (plus) dial strip is fitted, rectification is required

5. If a + (plus) strip was removed, fit a 0 (normal) dial strip. If a 0 (normal) dial strip was removed, fit a - (minus) dial strip. If a - (minus) strip was removed, rectification is required.

6. If the vaporizer output does not meet the required tolerance after a 0 (normal) dial strip is fitted, fit a - (minus) dial strip. If the vaporizer output does not meet the required tolerance after a - (minus) dial strip is fitted, rectification is required.

5.5 Fitting The New Dial Strip

1. Adjust the flowmeter fine adjustment valve to set a flow of 5 litres/minute of oxygen.

Note: Instructions 2, 3 and 4 must be performed within a time limit of 2.5 minutes. A longer interval can adversely affect the readings.

2. Operate the dial release and turn the dial to the estimated 1% position, bearing in mind the type of agent specific vaporizer which is being calibrated

3. Using the appropriate conversion chart, calculate the refractometer micrometer dial reading for 1% output from the vaporizer and then set the micrometer dial to the calculated reading

4. Wait until the refractometer fringes stabilize. If any fringe misalignment exists, turn the vaporizer dial until 1% + 0.05% v/v matching is achieved.

Note: Attach only a sufficient length of dial strip to hold the strip in position while the control dial is removed.

5. Peel off the backing strip from the graduated portion of the selected dial strip and [illegible] [illegible] strip to the circumference [illegible] lines up exactly with the zero mark on the vaporizer top plate.

6. Carefully turn the control dial to the OFF position, remove the two securing screws, remove the dial from the vaporizer and then remove the dial release, the springs from the dial assembly as described in Section 5.2.1

7. Complete the dial strip fitting procedure by pressing the strip along its full length against the surface of the dial.

8. Locate the end of the dial strip which is towards the rear of the control dial and opposite the dial insert slot and tuck it inside the opening in the rear of the control dial.

9. Trim any excess length off the strip if required to avoid internal projections.

10. If required, trim the non-folded end of the dial strip.

11. Fit the OFF indicator to the dial and record the type of dial strip which is now fitted to the dial (0, + or -).

12. Check the angular position of the graduated strip, using a measuring fixture either Part No. T1409 for Halothane and Isoflurane vaporizers or T1410 for Enflurane, as follows.

13. Fit the dial to the location dowels on the measuring fixture and check the position of the 1% mark on the dial strip relative to the angular markings on the fixture.

14. The 1% mark on the dial strip must lie within the 12 degrees included angle indicated on the measuring fixture. This included angle is 5 degrees to the left and 7 degrees to the right when viewed from above.

15. If the 1% mark does not fall within the specified tolerance and the dial is for either a Halothane or Isolfurane vaporizer, fit a Dial Out Of Tolerance (DOT) strip as follows. If any dial is still not within the specified tolerance, fit a new rotary valve as detailed in Section 3.0 and repeat the test.

5.6 Fitting Dial Out Of Tolerance (DOT) Dial Strips

1. Remove the dial from the measuring fixture and use an indelible pen to mark the 1% position on the underside edge of the dial.

2. Pull back the overlapping piece of the dial strip from within the dial and pull off the dial strip.

3. Remove any surplus glue from the dial using a cloth dampened with surgical spirit.

4. Mark the face of the dial in line with the line on the underside edge, using an indelible pen.

5. Select the equivalent DOT dial strip, either Part No 1105-3364-000 Nominal Dial Strip or 1105-3365-000 Minus Dial Strip, with reference to the dial strip removed in Instruction 2 and peel the backing off the graduated portion of the strip.

6. Attach the dial strip to the circumference of the dial so that the 1% mark lines up exactly with the indelible mark on the control dial.

7. Press the dial strip along its complete length firmly against the surface of the control dial.

2. Check the reading after 30 seconds and if it is 0.08% or less, turn the dial to the 0.2% mark and record the reading. If the reading is greater than 0.08%, allow an additional 30 seconds (a total of 60 seconds from the commencement of the test) and then record the reading and turn the dial to the 0.2% mark.

3. Maintain the alignment of the refractometer fringes. After 30 seconds, note the refractometer reading and then turn the dial to the 0.6% mark and record the result on the test sheet.

4. Repeat the operations described in instruction 3, but measuring and recording the output of the vaporizer at the dial settings of 1%, 2%, 3%, 4% & 5% (plus 6%, 7% & 8% if applicable).

5. Check that the vaporizer output at a controlled ambient temperature of 21 ± 2 deg. C is in accordance with the following table.

Hal., Enf. And Iso.		
Dial	Min.	Max.
0.0	0.00	0.08
0.2	0.10	0.30
0.6	0.50	0.70
1.0	0.90	1.10
2.0	1.80	2.20
3.0	2.70	3.30
4.0	3.60	4.40
5.0	4.50	5.50

Sevo. 5% And 8%		
Dial	Min.	Max.
0.0	0.0	0.08
0.2	0.10	0.30
0.6	0.50	0.70
1.0	0.90	1.10
2.0	1.80	2.20
3.0	2.70	3.30
4.0	3.60	4.40
5.0	4.70	5.50
6.0	5.40	6.60
7.0	6.35	7.70
8.0	7.20	8.80

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Section 6.0

Drain And Dry Out

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Fig 6.3 Draining A Keyed Filler Vaporizer 2

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6.1 General

⚠ Warning: Always use a fume cupboard when draining a vaporizer. Failure to do so may cause vapour from the drug to harm the operator.

⚠ Caution: Do not allow a bottle to become completely full during the draining procedure.

6.2 Draining The Vaporizer

6.2.1 Draining A Screw Cap Filler Vaporizer

1. Fit a drain adaptor Part No. 2802-8010-000 into the drain
2. Remove the screw cap filler knob and insert the hexagon end of the knob into the drain plug as illustrated in Fig. 6.1
3. Position a properly marked container under the drain adaptor
4. Unscrew but do not attempt to remove the drain plug and allow the vaporizer contents to pour from the drain adaptor into the container
5. After draining is complete, tighten the drain plug to minimise the possibility of leaks
6. Replace the screw cap filler knob and tighten it to minimise the possibility of leaks, then remove the drain adaptor

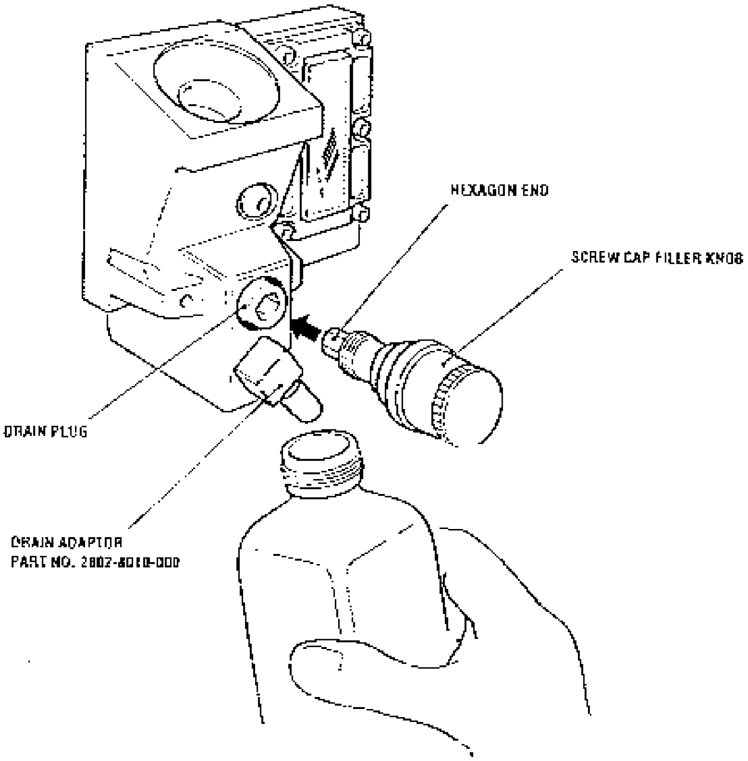

Fig. 6.1 Draining A Screw Cap Filler Vaporizer

6.2.2 Draining A Keyed Filler Vaporizer

The vaporizer must only be drained into a properly marked bottle.

1. Fit a bottle adaptor onto an empty bottle and insert the other end of the bottle adaptor into the filler port as illustrated in Fig. 6.2.

2. Tighten the clamp screw with the clamp screw securing tool, Part No. 2802-8021-000, until the adaptor is properly clamped.

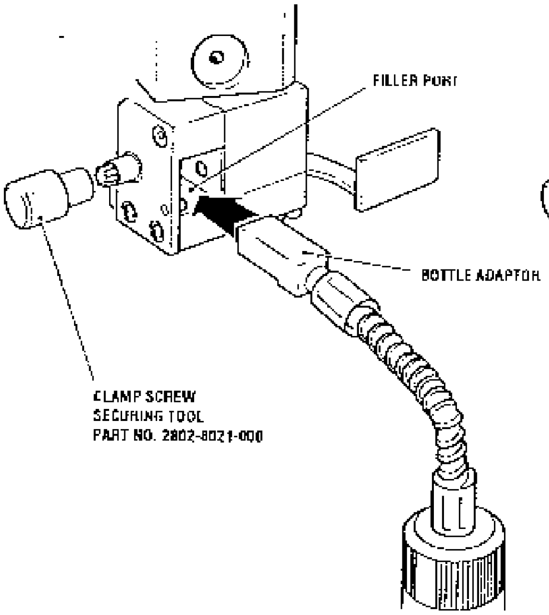

Fig. 6.2 **Fitting A Bottle Adaptor**

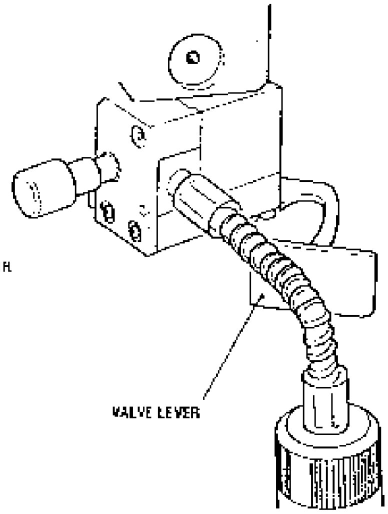

Fig. 6.3 **Draining A Keyed Filler Vaporizer**

3. Open the filler port valve by pulling the valve lever forward to its full extent as illustrated in Fig. 6.3.

4. Lower the bottle below the level of the filler port to allow the vaporizer contents to flow into the bottle. Do not allow the bottle to become completely full.

5. When the vaporizer is drained, close the filler port valve by pushing the valve lever to the rear, then release the clamp screw.

6. Remove the bottle adaptor from the filler port.

6.3 Drying Out The Vaporizer

[illegible] setting.

2. Pass an air supply of 15 litres/minute through the vaporizer for at least two hours or until [illegible]

Section 7.0

Final Leak Test

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Fig 7.1 Leak Test At OFF And ON 1

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7.1 Leak Testing

Note: The flow control valve on the 1 to 10 litre/minute flowmeter, Part No. 84017, must be open for the duration of the tests.

7.1.2 Leak Test At OFF

1. Mount the vaporizer on to stand Part No 60920, connect it into the test circuit and open shut off valve No. 2 so that the reservoir is in circuit. Ensure that the blanking plug is fitted into the outlet port of the stand, as illustrated in Fig. 7.1
2. Turn the dial to the OFF position, ensure that the filler and drain plugs are closed and open shut off valve No. 1 to pressurise the circuit to 300 mm Hg. Allow the pressure to stabilise and readjust if necessary
3. Measure and record the pressure drop after 30 seconds
4. The maximum allowed pressure drop is 5 mm Hg
5. Pull in the stop release and release it. Repeat instructions 2 and 3 and 4

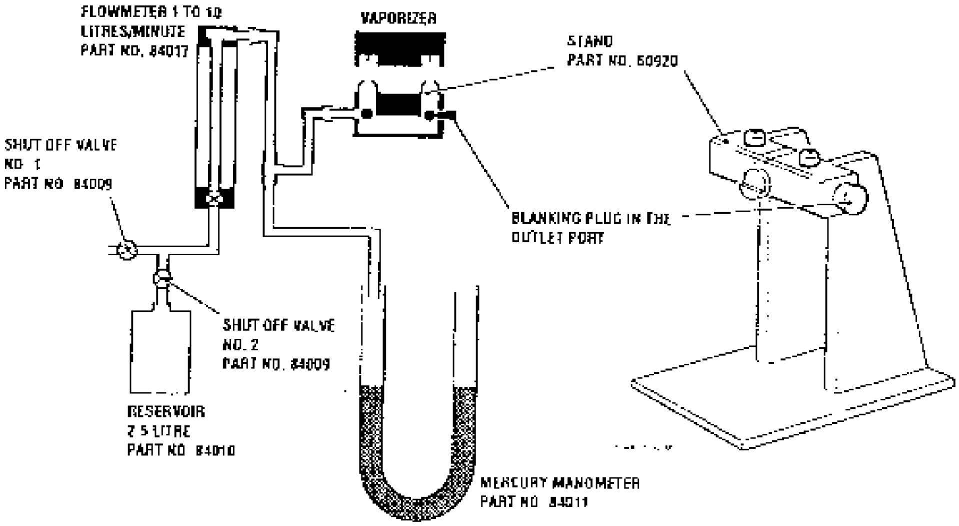
FLOWMETER 1 TO 10
LITRES/MINUTE
PART NO. 84017
VAPORIZER
STAND
PART NO. 60920
SHUT OFF VALVE
NO. 1
PART NO 84009
BLANKING PLUG IN THE
OUTLET PORT
SHUT OFF VALVE
NO. 2
PART NO. 84009
RESERVOIR
2.5 LITRE
PART NO 84010
MERCURY MANOMETER
PART NO 84011

Fig 7.1 Leak Test At OFF And ON

7.1.2 Leak Test At ON

1. Fully close shut off valve No. 2 to the reservoir and turn the vaporizer dial to 3%.
2. Using shut off valve No. 1, adjust the pressure in the circuit to 200 mm Hg as indicated by the manometer
3. Allow the mercury to stabilise and readjust if necessary.
4. Measure and record the pressure drop on the test sheet after 30 seconds.
5. The maximum allowed pressure drop is 4 mm Hg.
6. Turn the vaporizer dial to the OFF position.

7.1.3 Vent Test

1. Fully open shut off valve No. 2 and turn the vaporizer control dial to the midway position.
2. Using shut off valve No. 1, adjust the pressure in the circuit to 150 mm Hg as indicated by the manometer
3. Turn the vaporizer control dial slowly (click-by-click) to the OFF position whilst observing the manometer. Turn the vaporizer control dial ON slowly (click-by-click) to approximately the midway position, again observing the manometer. Record on the test sheet the lowest value obtained.

   Tolerance: The indicated pressure must not decrease below 120 mm Hg and must not decrease by more than 3 mm Hg over a 30 second period from the time of reaching the midway position stipulated in Instruction 3.
4. Disconnect the vaporizer from the test circuit and record the result of the test on the test sheet 4 of 4. Open the filler mechanism slightly to release any pressure trapped in the sump. Close the filler mechanism after the pressure is released.
5. Remove the blanking plug from the outlet port of the stand.

Section 8.0

Final Assembly

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Fig. 8.3 Fitting The Keyed Filler Wrap And Base Cover 3
Fig 8 4 Fitting The Keyed Filler Cover And Clamp Lever 4

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8.1 Screw Cap Filler (Fig. 8.1 And 8.2)

1. Remove the screw cap filler plug
2. Fit a new, short, self-adhesive strip to the sump cover
3. Fit the correct filler specific wrap to the vaporizer and secure it to the gas transfer manifold with the four counter sunk headed screws. Torque tighten the screws to 0.6 Nm

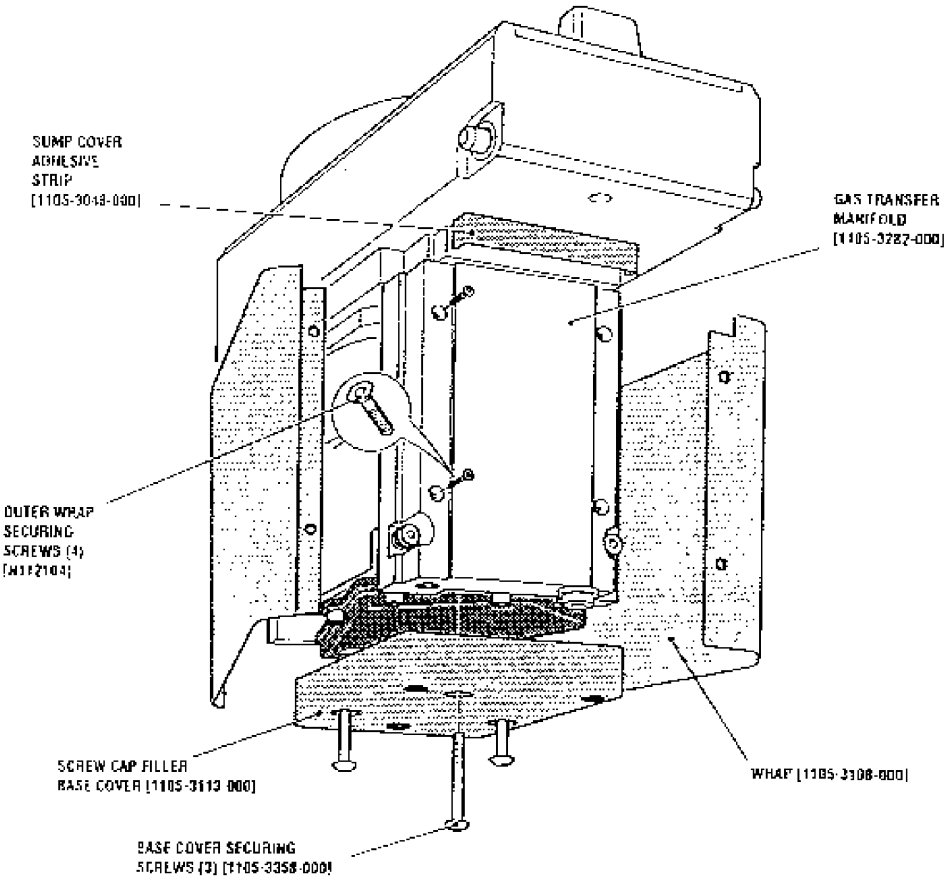
SUMP COVER ADHESIVE STRIP [1105-3048-000]
GAS TRANSFER MANIFOLD [1105-3287-000]
OUTER WRAP SECURING SCREWS (4) [N112104]
SCREW CAP FILLER BASE COVER [1105-3113-000]
WRAP [1105-3108-000]
BASE COVER SECURING SCREWS (3) [1105-3358-000]

Fig. 8.1 Fitting The Screw Cap Filler Wrap And Base Cover

4. Fit a new filter cover 'O' ring seal to the screw filler body and fit a new filler gasket onto the filler body.

5. Push the filler cover into position, ensuring that the lips of the cover fit onto the wrap. Secure with the two securing screws and torque tighten to 1.0 Nm using tool Part No 2802-8052-000

6. Fit the base cover using the three securing screws and torque tighten the screws to 2.0 Nm using tool Part No. 2802-8053-000.

7. Screw the filler plug into the filler.

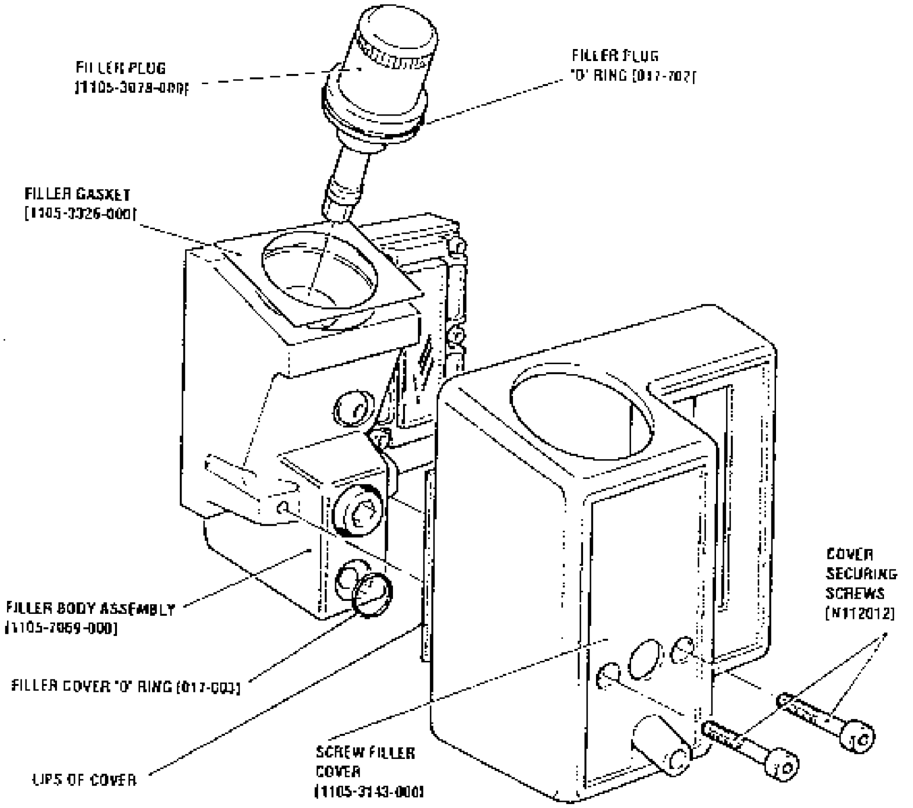
FILLER PLUG
[1105-3078-000]
FILLER PLUG
'O' RING [017-707]
FILLER GASKET
[1105-3326-000]
FILLER BODY ASSEMBLY
[1105-7069-000]
FILLER COVER 'O' RING [017-003]
LIPS OF COVER
SCREW FILLER
COVER
[1105-3143-000]
COVER
SECURING
SCREWS
[N112012]

Fig. 8.2 Fitting The Screw Filler Cover

8.2 Keyed Filler (Fig. 8.3 And 8.4)

1. Fit a new, short, self-adhesive strip to the sump cover.

2. Fit the correct filler specific wrap to the vaporizer and secure it to the gas transfer manifold with the four countersunk headed screws. Torque tighten the screws to 0.6 Nm using tool Part No. 2802-8051-000.

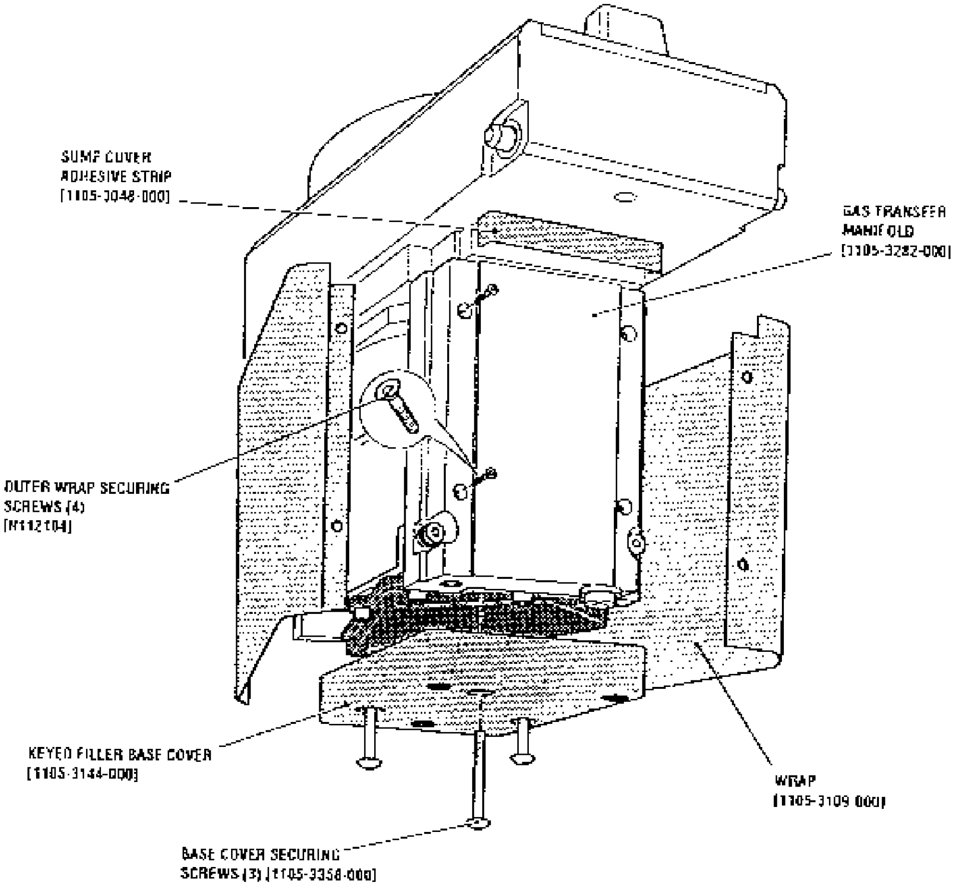
SUMP COVER
ADHESIVE STRIP
[1105-3048-000]
GAS TRANSFER
MANIFOLD
[1105-3282-000]
OUTER WRAP SECURING
SCREWS (4)
[N112104]
KEYED FILLER BASE COVER
[1105-3144-000]
WRAP
[1105-3109-000]
BASE COVER SECURING
SCREWS (3) [1105-3358-000]

Fig. 8.3 Fitting The Keyed Filler Wrap And Base Cover

3. Stand the vaporizer on its dial, pull out the valve lever and fit the base cover using the three securing screws. Torque tighten the securing screws to 2.0 Nm using tool Part No 2802-8053-000 and then push the valve lever back [illegible]

4. Ensure that the filler cover incorporates a small aperture to accommodate the clamping assembly, as illustrated on Fig. 8.4.

5. Position the filler cover assembly complete with rubber seal over the keyed filler assembly as illustrated on Fig. 8.4. Fit the one or two securing screws and torque tighten to 1.0 Nm using tool Part No. 2802-8052-000.

6. Fit the Minimum end of the bottle adaptor gauge Part No 2802-8014-000 into the socket of the keyed filler body and then use the clamp screw securing tool to turn the clamp screw until it only just retains the adaptor gauge in position.

7. Fit a steel shim Part No. 46267 on to the clamp screw followed by two Viton washers Part No 1105-3325-000 and another steel shim.

8. Fit the clamp lever onto the clamp screw with the lever in the mid position of its range.

9. Lift up the lever to the unlocked position, verify that the Maximum end of the adaptor gauge can now be inserted into the socket of the keyed filler body and then remove the gauge.

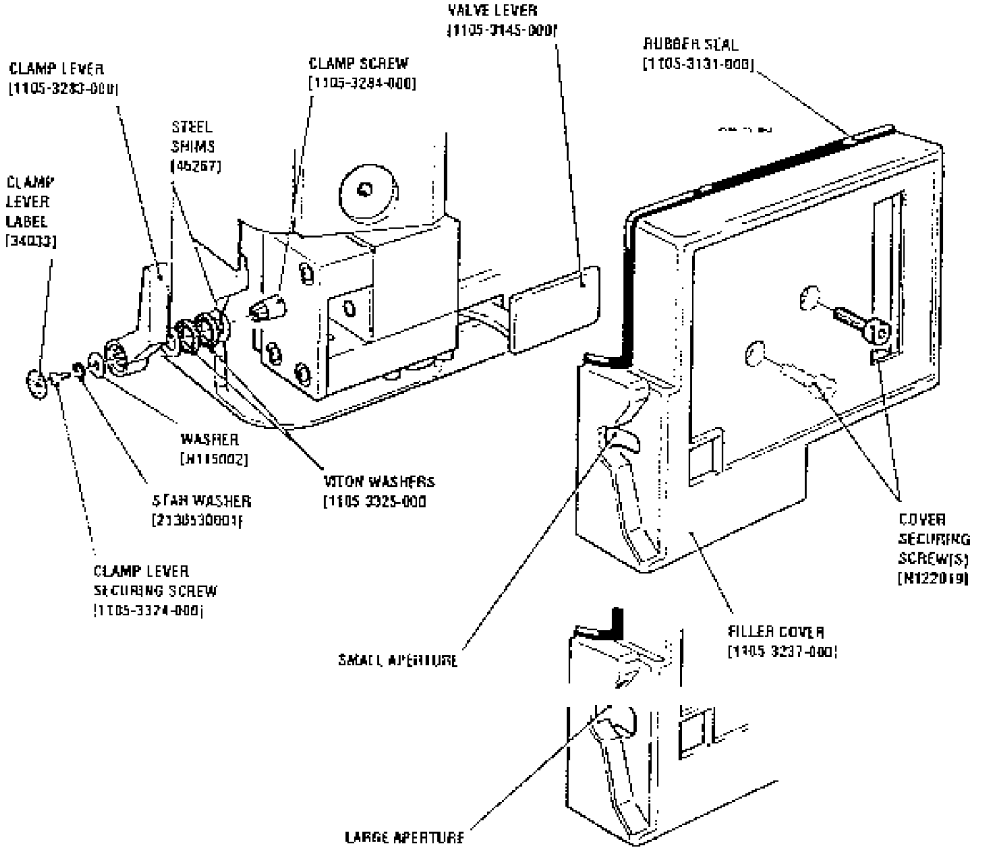
VALVE LEVER
[1105-3145-000]
RUBBER SEAL
[1105-3131-000]
CLAMP LEVER
[1105-3283-000]
CLAMP SCREW
[1105-3284-000]
STEEL
SHIMS
[46267]
CLAMP
LEVER
LABEL
[34033]
WASHER
[N115002]
STAR WASHER
[2130530001]
VITON WASHERS
[1105 3325-000
CLAMP LEVER
SECURING SCREW
[1105-3374-000]
COVER
SECURING
SCREW(S)
[N122019]
FILLER COVER
[1105 3237-000]
SMALL APERTURE
LARGE APERTURE

Fig. 8.4 Fitting The Keyed Filler Cover And Clamp Lever

10. Fit a new plain washer and a shakeproof washer onto the new clamp lever securing screw and then fit the securing screw through the clamp lever into the clamp screw Torque tighten the screw to 0 6 Nm using tool Part No 2802-8051-000

11. With the lever in the unlocked position check that a firm pressure is required to move the lever to the locked position and that there is no excessive sideways movement.

12. If the lever either moves under its own weight, or requires only a light pressure to move it, or has an excessive sideways movement, remove the lever assembly and repeat the procedure using either one or two additional new Viton washers as necessary to obtain a satisfactory clamping action.

Note: If a satisfactory assembly cannot be achieved using a maximum of four Viton washers, disassemble the lever assembly and reassemble it using new parts.

13. When a satisfactory clamping action is achieved, fit a new clamp lever label into the recess in the clamp lever

14. Check that the NO GO portion of gauge Part No 60498 cannot be inserted into the filler aperture, thereby establishing that the pin is the correct height

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Section 9.0

Clean And Label

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9.1 Preliminary

1. Fill the base cover securing screw heads, illustrated in Fig. 9.1, with anti-tamper compound (Shellac) Part No. 2802-8050-000.

2. Clean the vaporizer with a suitable cleaning agent and ensure that there are no particles of old label or adhesive deposits on the vaporizer

9.2 Fitting The Vaporizer ID Label

⚠ **Warning: The correct agent specific vaporizer ID label must be fitted to the gas transfer manifold. Failure to do so may result in patient injury.**

1. Carefully peel the backing paper from a new, correct agent specific, ID label.

2. Position the adhesive surface of the label squarely on to the transfer manifold, as illustrated in Fig. 9.1, ensuring that the following criteria are satisfied:

   a) The lower edge of the label adjacent to the agent name is positioned along the lower edge of the manifold

   b) The side edges of the label are positioned along the side edges of the manifold

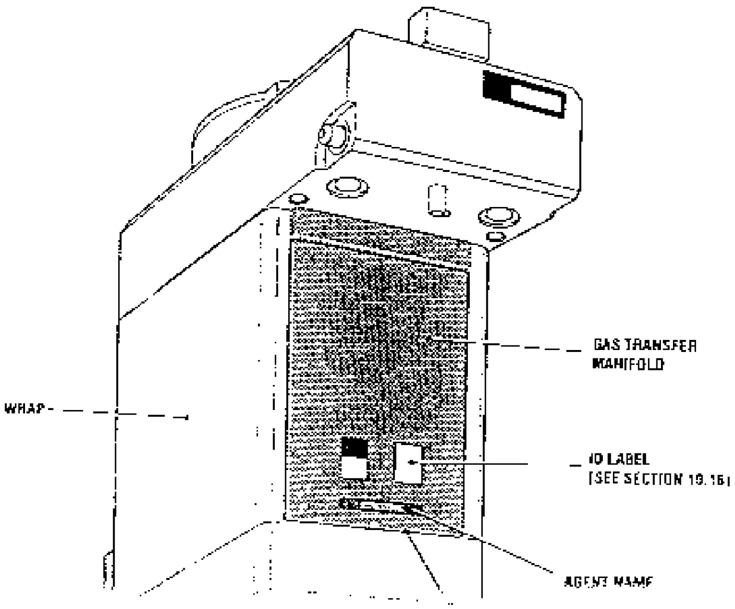


Fig. 9.1 Fitting The Vaporizer ID Label And The Wrap Label Strips

9.3 Fitting The Labels

1. Remove the locking lever securing screw and then remove the locking lever

⚠ **Warning: Ensure that the correct agent specific filler body label is fitted.**

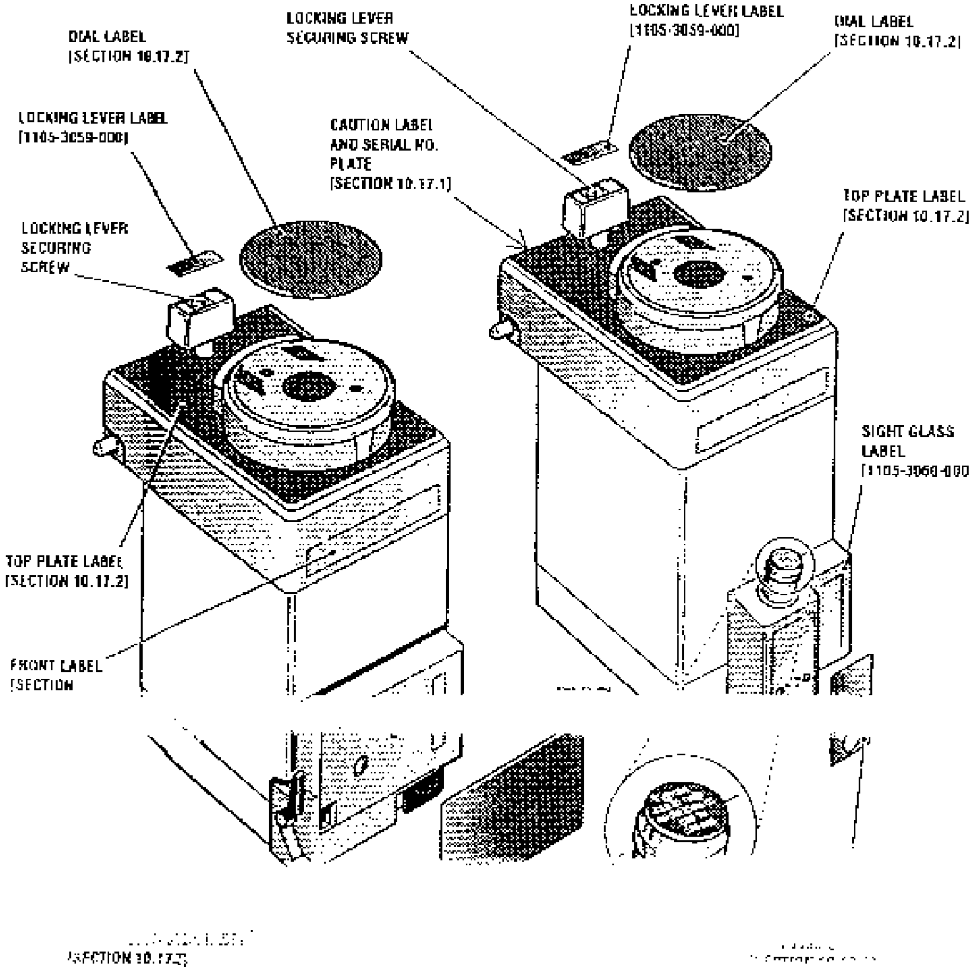
2. Fit a new top plate label, a new dial label and a new, filler specific, body label as illustrated on Fig 9.2.

3. Refit the locking lever and secure it with the locking lever securing screw

4. Torque tighten the locking lever securing screw to 1.0 Nm using tool Part No 2802-8052-000 and then fit a new locking lever label

5. Inspect the Serial No. plate, the Caution label, if fitted, the agent specific front label and the screw cap filler sight glass label. Fit new items as necessary

6. Verify that the filler plug label is positioned so that it can easily be read, as illustrated on Fig. 9.2.


DIAL LABEL [SECTION 10.17.2]
LOCKING LEVER SECURING SCREW
LOCKING LEVER LABEL [1105-3059-000]
DIAL LABEL [SECTION 10.17.2]
LOCKING LEVER LABEL [1105-3059-000]
CAUTION LABEL AND SERIAL NO. PLATE [SECTION 10.17.1]
TOP PLATE LABEL [SECTION 10.17.2]
LOCKING LEVER SECURING SCREW
SIGHT GLASS LABEL [1105-3060-000
TOP PLATE LABEL [SECTION 10.17.2]
FRONT LABEL [SECTION
[SECTION 10.17.2]

9.4 Final Check - Keyed Filler

9.4.1 Clamping

1. With the lever in the unlocked position, verify that the Maximum end of the adaptor gauge can be inserted into the socket of the keyed filler body and then remove the gauge.

2. Fit the Minimum end of the bottle adaptor gauge Part No 2802 8014-000 into the socket of the keyed filler body

3. Check that a firm pressure is required to move the lever towards the locked position and that there is no excessive sideways movement

4. Check that when the lever attains the mid position of its range it only just retains the adaptor gauge in position

5. If satisfactory clamping cannot be achieved, it may be necessary to reset the clamp lever as follows:

   a. Remove the lever assembly

   b. Fit either one or two additional new Viton washers as necessary to obtain a satisfactory clamping action. A total of four Viton washers is permitted

6. If satisfactory clamping still cannot be achieved, disassemble the lever assembly and reassemble it using new parts

7. When a satisfactory clamping action is achieved, fit a new clamp lever label into the recess in the clamp lever

9.4.2 Agent Type And Pin Height

1. Verify that the correct agent specific gauge, Part No 2802-8017-000 for Enflurane and Halothane, Part No 2802-8018-000 for Isoflurane or Part No 2802-8019-000 for Sevoflurane, can be inserted into the filler aperture

2. Check that no other agent specific gauge can be inserted into the filler aperture

3. Check that the NO GO portion of gauge Part No 64098 cannot be inserted into the filler aperture, thereby establishing that the pin is the correct height

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Section 10.0

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10.1 Spare Parts Required When Servicing An ECV Version

Spare parts are classified in 3 categories, as follows:

10.1.1 Category 1

Parts which are specific to an ECV Version vaporizer and must be renewed during service

Description	Part No.
Dial Label	See Sect 10 17 3
Vaporizer ID Label	
Enflurane	1105-3449-000
Isoflurane	1105-3420-000
Halothane	1105-3379-000
Sevoflurane	1105-3478-000
Spinning Assembly 'O' Ring	017-621
GTM/Sump 'O' Ring	017 901
Back Plate	1105-3286-000
Sump Filler Boss 'O' Ring	017-603

10.1.2 Category 2

Parts which must be renewed to comply with the latest ECV specification:

Description	Part No.
Bridge Piece.	
Halothane	1105-3292-000
Isoflurane	1105-7078-000
Enflurane	1105-7077-000
Sevoflurane	1105-7079-000
Clamp Screw	1105-3284-000
Clamp Lever Securing Screw	1105-3324-000
Clamp Lever	1105-3283-000
Shims (2)	46267
Viton Washers, Maximum (4)	1105-3325-000
Valve Lever Disc Spring	029-100
Window Clamp Plate	1105-3321-000
Seal For Window (Front)	1105-3322-000
Seal For Window (Rear)	1105-3266-000
Level Body Sump Seal	017-603
Top Cover Plate	1105-3327-000
Screw Filler Drain Plug	1105-7121-000
Base Cover Screw	1105-3358-000

10.2 Introduction

An Item No. prefixed by an asterisk * signifies a redesigned component with a new Part No. which must be used only when existing stocks of the original Part No. are exhausted.

10.3 Labels and Covers (Fig. 10.1)

Item No.	Part No.	Description
1	See Section 10.17	Locking Lever Cover
2	See Section 10.17	Dial Label
3	See Section 10.17	Top Plate Label
4	1105-3108-000	Screw Cap Filler Outer Wrap
5	See Section 10.17	Screw Cap Filler Plug Label
6	1105-3060-000	Screw Cap Filler Sight Glass Label
7	See Section 10.17	Screw Cap Filler Cover Label
8	1105-3143-000	Screw Cap Filler Cover
9	1105-3358-000	Base Cover Screw
10	1105-3113-000	Screw Cap Filler Base Cover
11	1105-3237-000	Keyed Filler Cover
12	See Section 10.17	Keyed Filler Cover Label
13	1105-3144-000	Keyed Filler Base Cover
14	1105-3109-000	Keyed Filler Outer Wrap
15	1105-????-000	Front Label

Note: Any vaporizer with a front label incorporating the old style Ohmeda logo ( ) must have the label replaced with one which incorporates the new Ohmeda logo (OHMEDA). The new front label may remain in place at subsequent service unless it is defaced or damaged

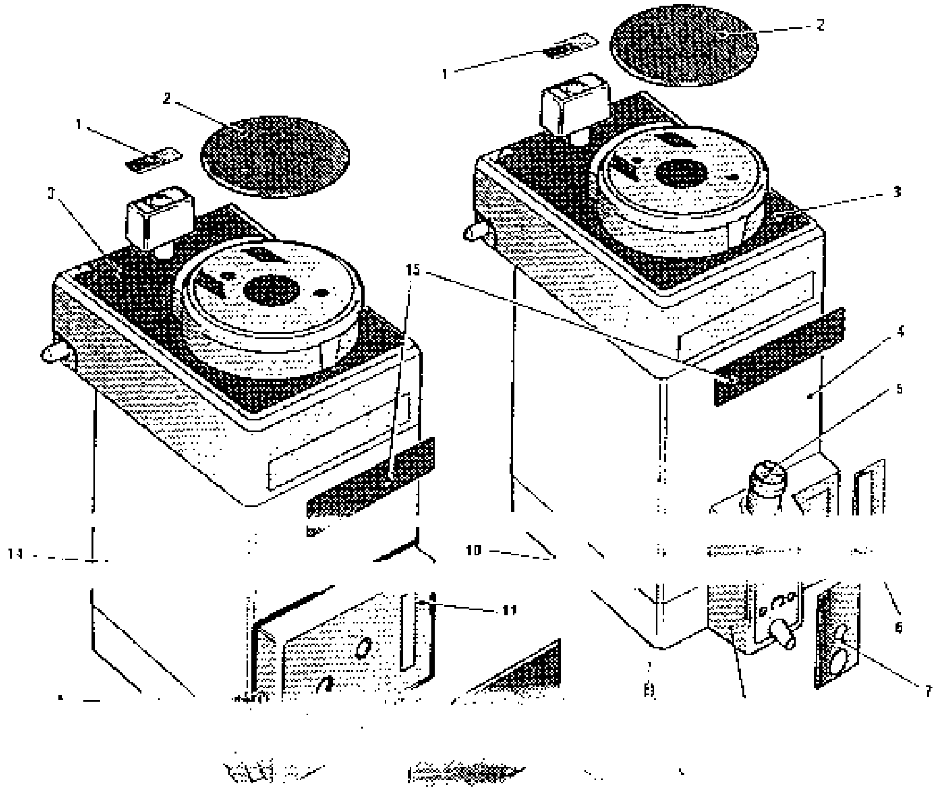
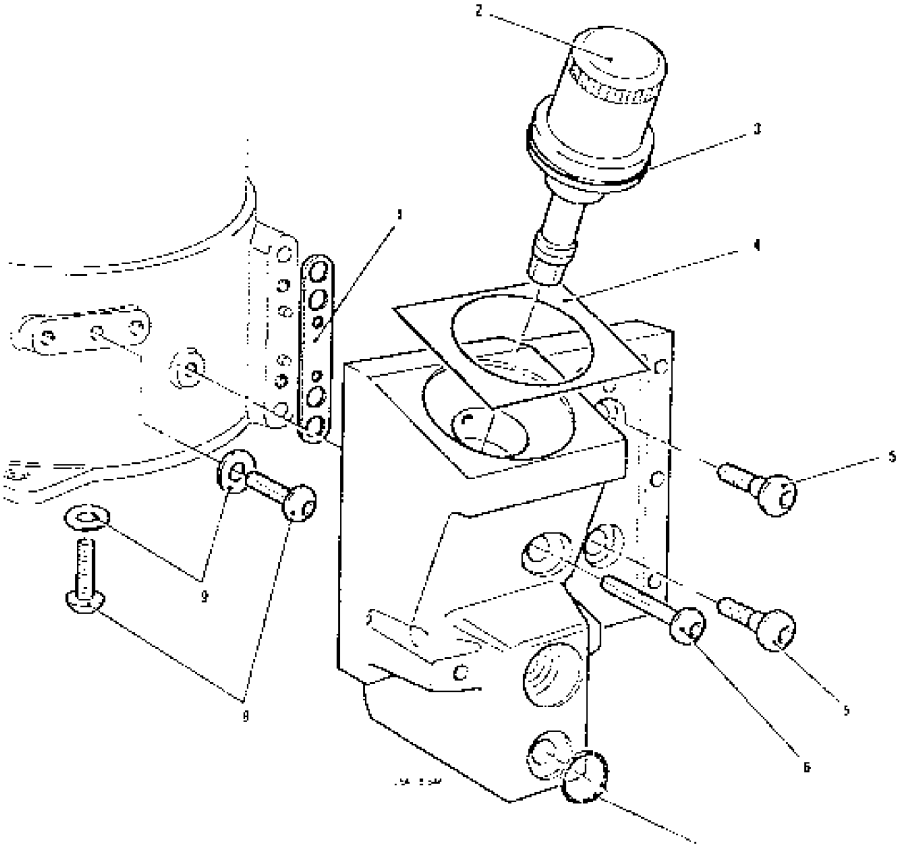


Fig. 10.1 Labels And Covers

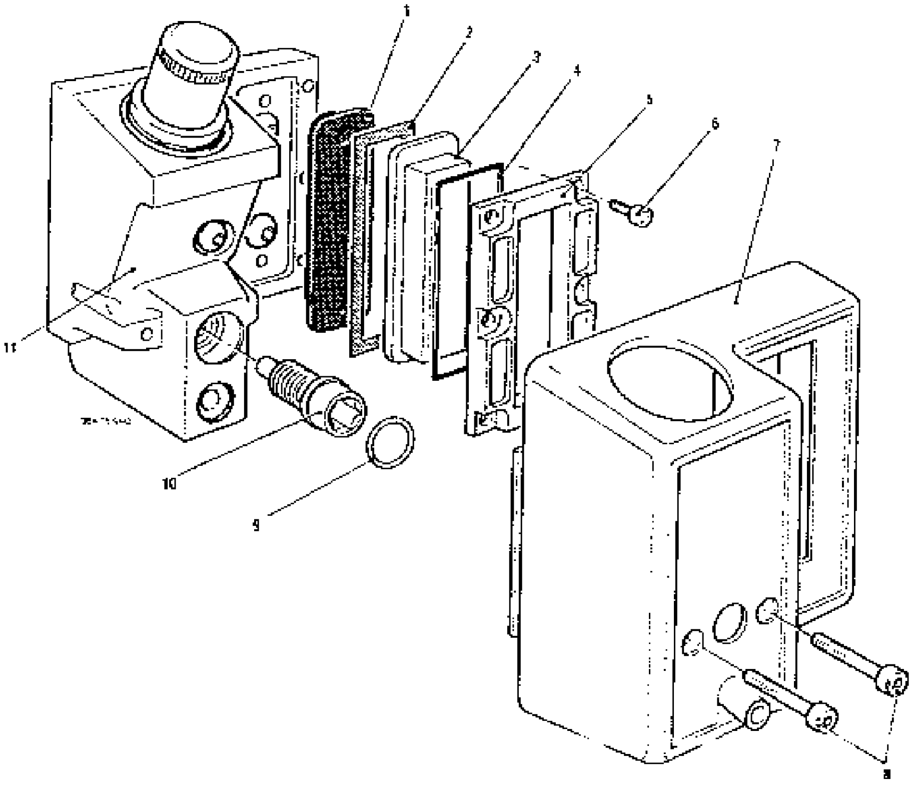
10.4 Screw Cap Filler Body Assembly (Fig. 10.2)

Item No.	Part No.	Description
1	1105-3211-000	Gasket for Filler Boss
2	1105-3078-000	Filler Plug
3	017-702	'O' Ring for Filler Plug
4	1105-3326-000	Gasket
5	N122209	Short Securing Screw for Filler Body
6	N122210	Long Securing Screw for Filler Body
7	017-003	'O' Ring for Filler Cover
8	N132203	Plug Screw
9	019-008	Plug Seal



10.5 Screw Cap Filler Window, Drain Plug And Cover Assembly (Fig. 10.3)

Item No.	Part No.	Description
1	1105-3286-000	Back plate
2	1105-3266-000	Seal for Window
3	1105-3147-000	Sight Glass
4	1105-3322-000	Seal For Window Front
5	1105-3321-000	Window Clamp Plate
6	N112012	Screw for Cover Glass
7	1105-3143-000	Screw Cap Filler Cover
8	N112012	Filler Cover Securing Screw
9	017-700	'O' Ring for Drain Plug
10	1105-7121-000	Drain Plug
11	1105-7069-000	Screw Filler Body



10.6 Keyed Filler Assembly (Fig. 10.4)

Item No.	Part No.	Description
1	1105-3237-000	Keyed Filler Cover
2	1105-3131-000	Rubber Seal for Cover
3	N122019	Screw for Keyed Filler Cover
4	1105-3325-000	Viton Washer
5	N115002	Clamp Screw Washer
6	2130530001	Shakeproof Washer
7	1105-3324-000	Clamp Lever Securing Screw
8	34033	Clamp Screw Label
9	1105-3283-000	Clamp Lever
10	46267	Steel Shim
11	1105-3284-000	Clamp Screw

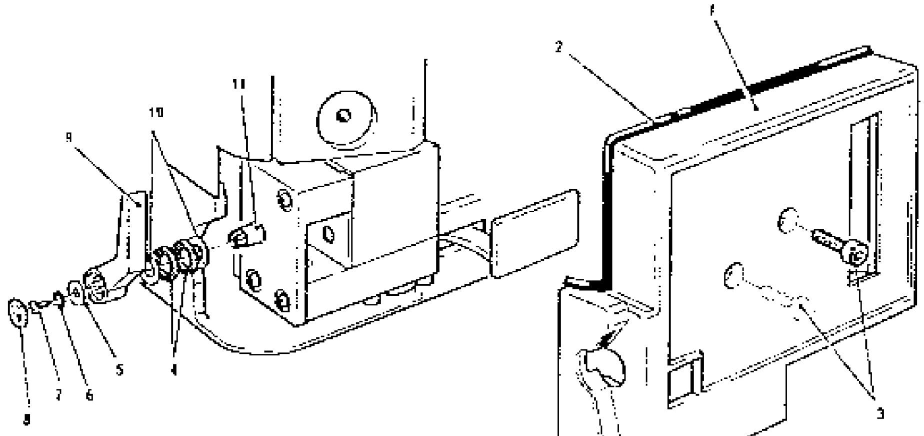
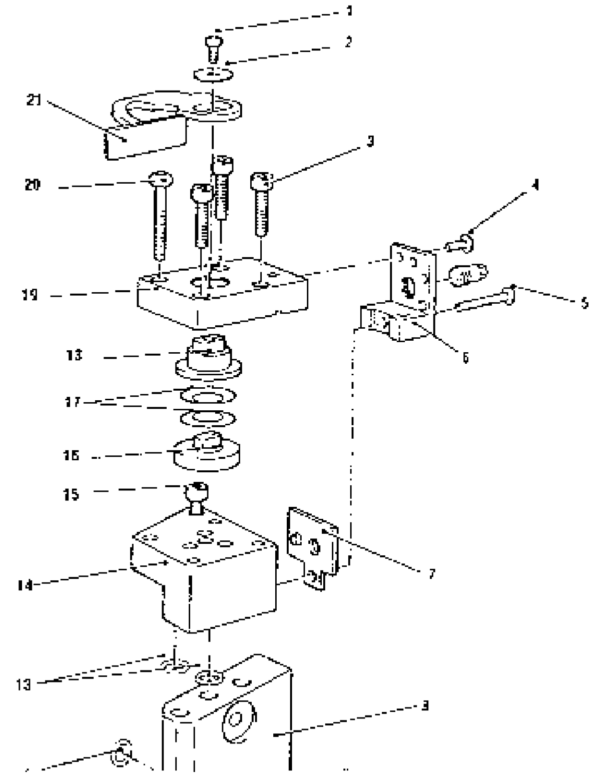


Fig. 10.4 Keyed Filler Assembly

10.7 Keyed Filler Body Assembly (Fig. 10.5)

Item No.	Part No.	Description
1	1105-3324-000	Valve Lever Securing Screw
2	029-100	Valve Lever Disc Spring
3	N122020	Lower Plate Securing Screw
4	N112206	Bridge Piece Screw (Short)
[illegible]	1105-3121-000	Bridge Gasket

Item No.	Part No.	Description
8	1105-7080-000	Top Block
9	N122022	Top Block Securing Screw
10	N122024	Top Block Screw (Long)
11	N122021	Top Block Screw (Short)
12	017-603	Top Block 'O' Ring
13	017-603	Valve Block 'O' Rings
14	1105-7047-000	Valve Block
15	N122022	Valve Block Securing Screw
16	1105-3120-000	Valve
17	1105-3146-000	Disc Spring
18	1105-3124-000	Valve Drive
19	1105-3123-000	Lower Plate - Enflurane, Isoflurane & Sevoflurane
	1105-7046-000	Lower Plate - Halothane
20	N122213	Assembly Securing Screw
21	1105-3145-000	Valve Lever



10.8 Keyed Filler Window Assembly (Fig. 10.6)

Item No.	Part No.	Description
1	1105-3211-000	Gasket for Filler Boss
2	1105-3233-000	Window Body
3	1105-3286-000	Back Plate
4	1105-3266-000	Sight Glass Seal
5	1105-3147-000	Sight Glass
6	1105-3322-000	Window Front Seal
7	1105-3321-000	Window Clamp Plate
8	N112012	Clamp Plate Securing Screw
9	N122208	Securing Screw for Filler Body

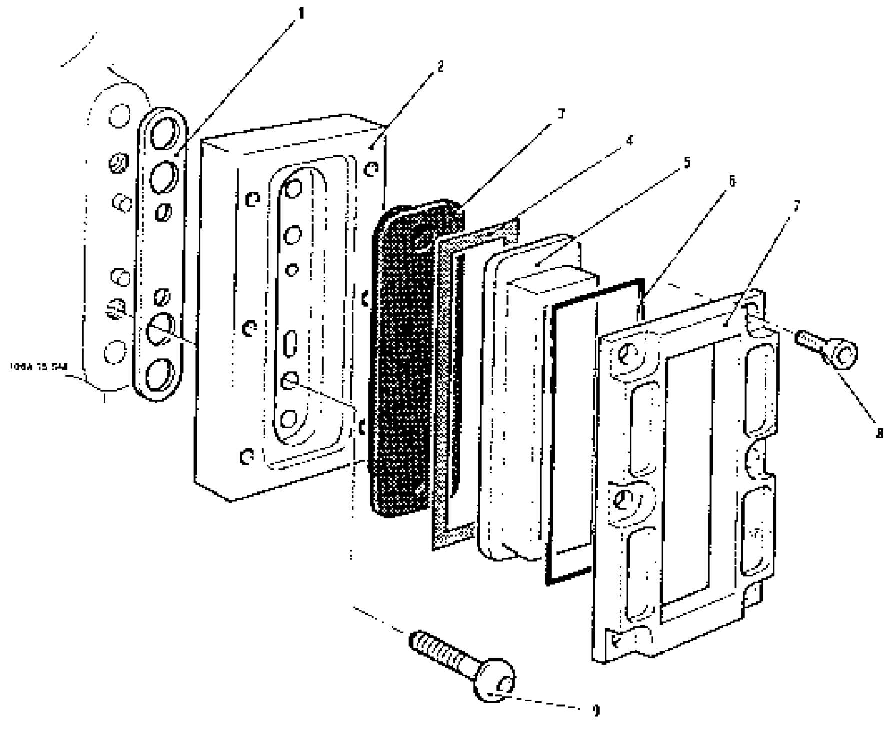


Fig. 10.6 Keyed Filler Window Assembly

10.9 Dial And Top Plate Assembly (Fig. 10.7)

Item No.	Part No.	Description
1	N122212	Dial Drive Securing Screw (Type-A)
	N122210	Dial Drive Securing Screw (Type B)
2	1105-3018-000	Dial
3	N122206	Top Cover Plate Securing Screw
4	1105-3110-000	Drive Disc Type A
	1105-3323-000	Drive Disc Type B
5	1105-3327-000	Top Cover Plate
6	1105-3350-000	Locking Lever
7	N112012	Screw For Locking Lever Knob
8	1105-3019-000	Dial Release
9	1105-3135-000	Dial Catcher
10	1105-3029-000	Dial Release Spring
11	1105-3100-000	Stop Moulding

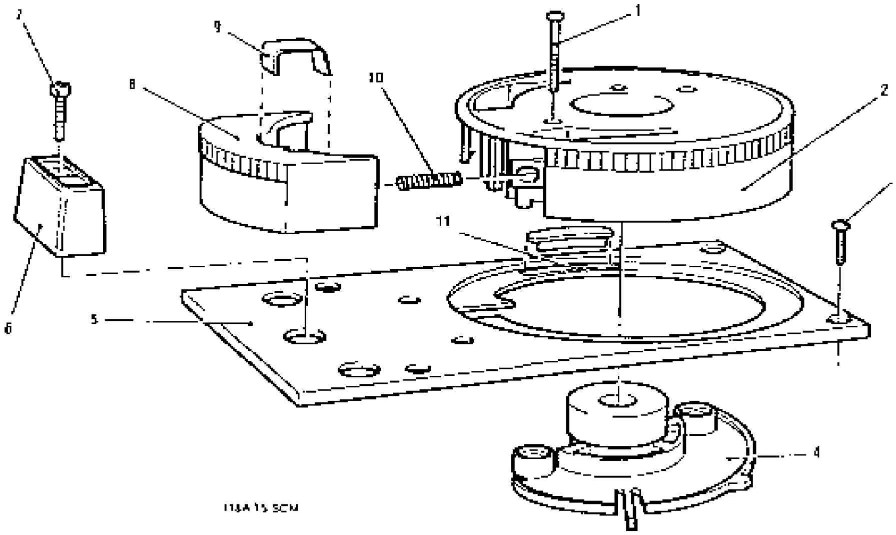


Fig. 10.7 Dial And Top Plate Assembly

10.10 Interlock Rods Assembly (Fig. 10.8)

Item No.	Part No.	Description
1	1105-3008-000	Interlock Bush
2	017-308	Filter 'O' Ring
3	1105 7056-000	Filter Assembly
4	017-103	Filter Seal
5	34039	Retaining Screw
6	34098	Interlock Rod Spring
7	35009	Interlock Rod Thrust Washer
8	34022	Short Interlock Rod Assembly
9	34021	Long Interlock Rod Assembly
10	1105-3005-000	Spindle Bush

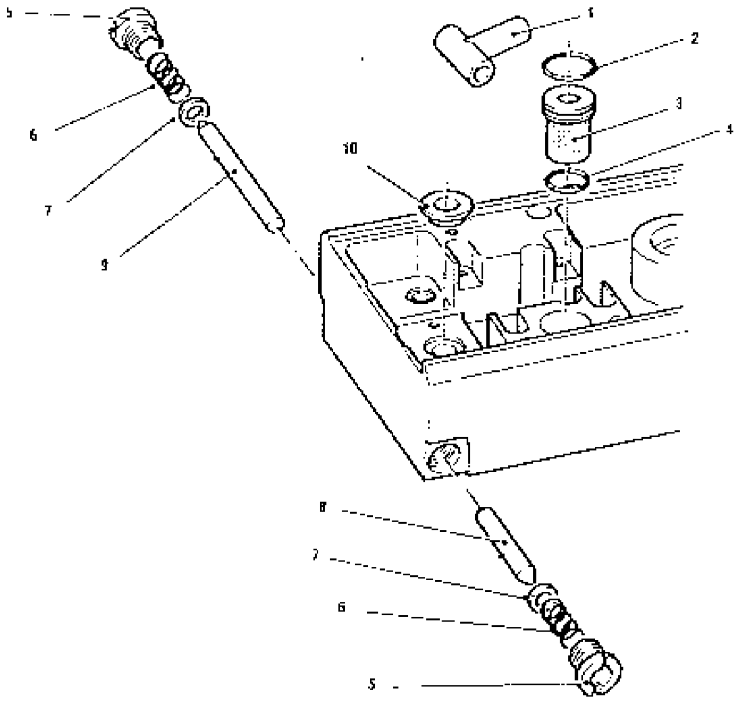
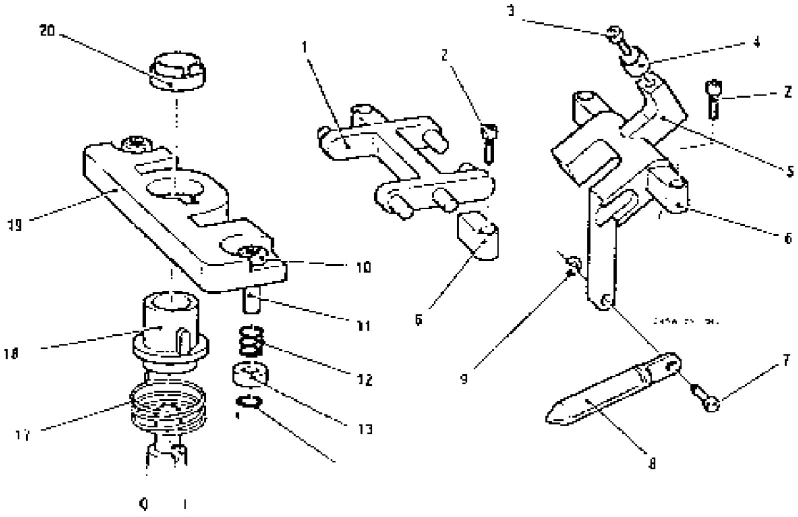


Fig. 10.8 Interlock Rods Assembly

10.11 Interlock Mechanism Assembly (Fig. 10.9)

*Note: An Item No. prefixed by an asterisk * signifies a redesigned component with a new Part No. which must be used only when existing stocks of the original Part No. are exhausted.*

Item No.	Part No.	Description
*1	1107-3005-000	Lever Platform
2	N112012	Bearing Bush Screw
3	1105-3134-000	Roller Stepped Screw
4	1107-3907-000	Roller
5	1105-3369-000	Bell Crank Lever
6	1105-3020-000	Bearing Bush
7	1105-3006-000	Pivot Pin
8	1105-3007-000	Interlock Plunger
9	016-002	Circlip
10	N123602	Nut for Spindle
11	1105-3025-000	Actuator Spindle
12	1105-3031-000	Spring for Actuator Spindle
13	1104-3055-000	Seal Housing
14	017-404	Seal for Actuator Spindle
15	1105-3030-000	Spring for Locking Lever Spindle
16	1105-7122-000	Locking Spindle Assembly
17	1105-3354-000	Torsion Spring
18	1105-3084-000	Locking Collar
19	1105-3081-000	Platform
20	1105-3009-000	Top Plate Bush



10.12 Rotary Valve And Sump Cover Assembly (Fig. 10.10)

Item No.	Part No.	Description
1	N122017	Sump Cover Screws
2	017-934	Quad Ring Seal
3	1104-3020-000	Thrust Washer
4	57027	Fluon Washer
5	1105-3148-000	Rotary Valve - Halothane and Isoflurane
	1105 3149-000	Rotary Valve - Enflurane
6	1105-7076-000	Sump Cover
7	026 001	Nylon Ball
8	N150702	Nylon Grubscrew
9	57045	Compression Spring
10	017-006	Seal for Interlock Block
11	017-621	Large Seal for Interlock Block
12	1105-3119-000	Interlock Block
13	1105-3026-000	Stop Screw For Interlock Collar Spring
14	N122017	Manifold Securing Screws

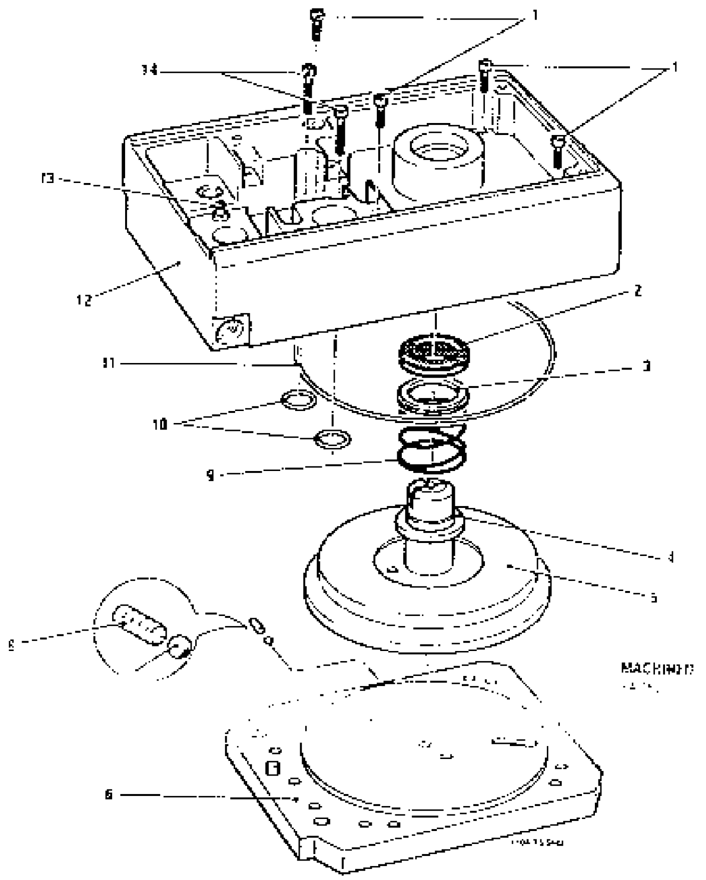
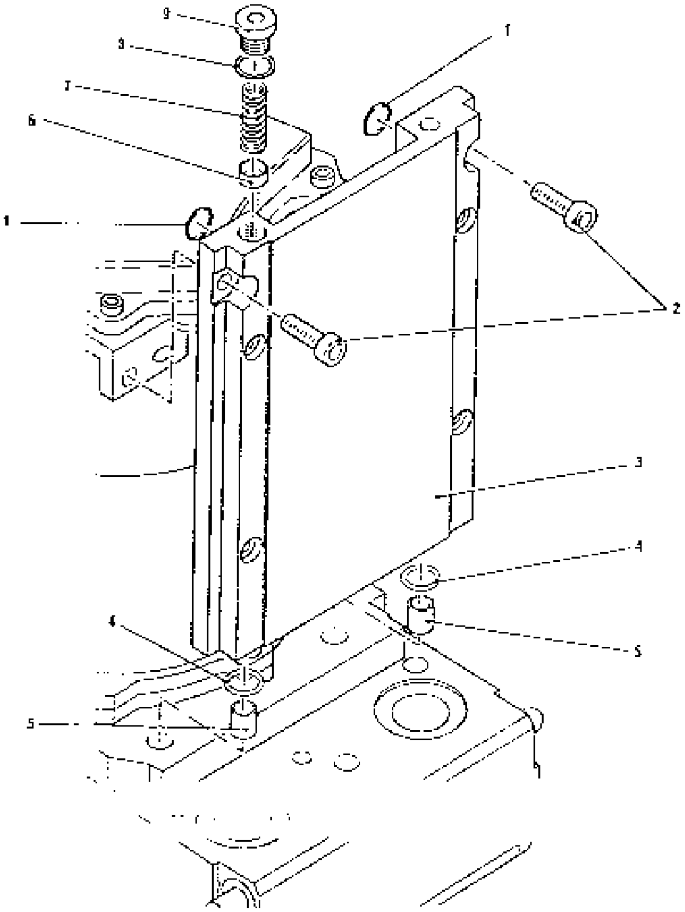


Fig. 10.10 Rotary Valve And Sump Cover Assembly

10.13 Manifold Assembly (Fig. 10.11)

Item No.	Part No.	Description
1	017-901	Seal for Transfer Manifold
2	N122018	Manifold Securing Screw
3	1105-3282-000	Transfer Manifold
4	017-006	Dowel Seal
5	1105 3011-000	Hollow Dowel for Manifold
6	1105-3040 000	Restrictor - Halothane and Isoflurane
	1105-3041-000	Restrictor Enflurane
7	1105-3044-000	Spring
8	1105-3066-000	Plug Seal
9	1105-3039-000	Plug



10.14 Sump Assembly (Fig. 10.12)

Item No.	Part No.	Description
1	1105-7075-000	Sump Assembly
2	N122020	Sump Securing Screw
3	N125001	Washer
4	1105-3279-000	Sump Sleeve
5	017-621	'O' Ring for Sump
6	1105-3032-000	Outer Wick
7	1105-7003-000	Spiral Wick Assembly
8	1105-7041-000	Spinning Assembly
9	N122020	I.P.P.V Securing Screw
10	1105-3202-000	Copper Gasket
11	1105-3083-000	I.P.P.V Assembly
12	017-603	Seal for IPPV Body
13	N122208	Spinning Assembly Screw

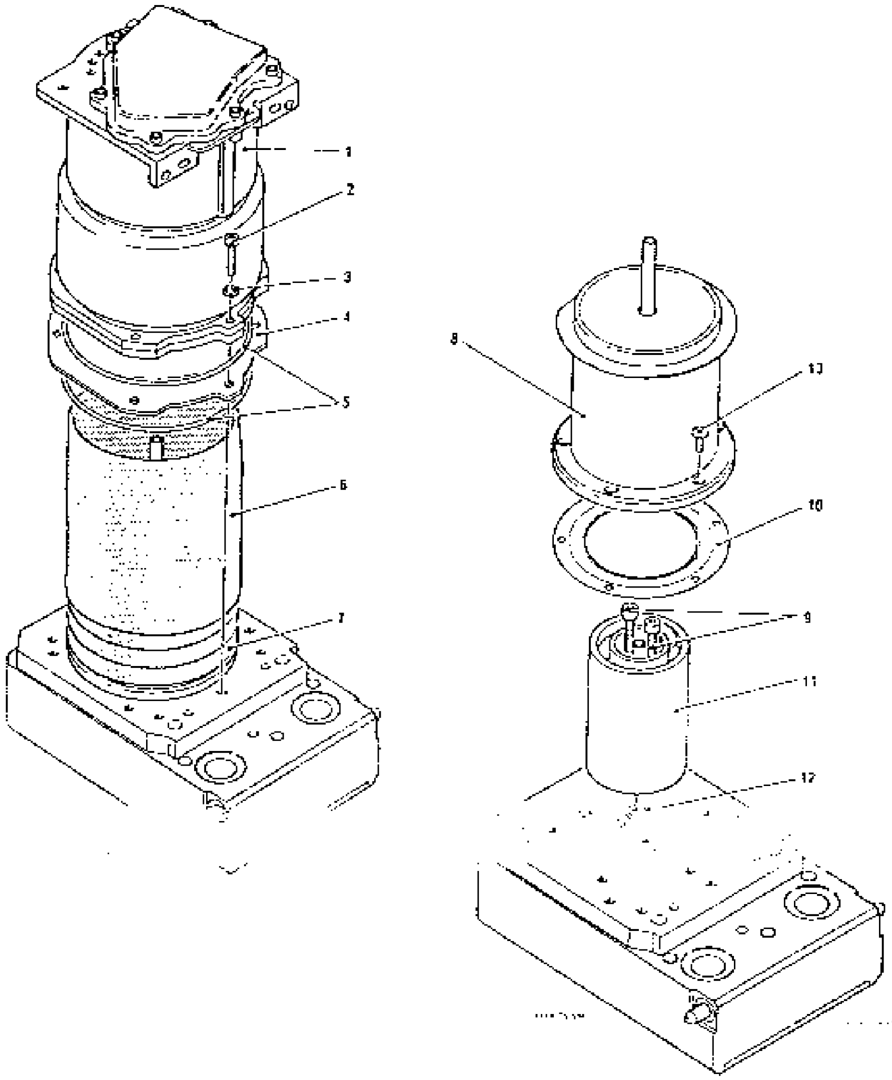


Fig. 10.12 Sump Assembly

10.15 Thermostat Assembly (Fig. 10.13)

Item No.	Part No.	Description
1	1105-3116-000	Gasket
2	1105-3104-000	Thermostat Cover
3	N122019	Thermostat Cover Securing Screw
4	N125001	Washer - M4
5	N122018	Thermostat Spring Securing Screw
6	1105-3033-000	Thermostat Spring
7	1105-3289-000	Hinge Plate Flapper
8	N122207	Hinge Plate Screw
9	1105-3288-000	Hinge Plate Body
10	1105-3096-000	Hinge Strip
11	1105-3106-000	Thermostat Flapper and Boss (Matched Pair)
12	1105-3043-000	Thermostat Shim
13	015-302	Dowel Pin
14	1105-3154-000	Thermostat Stop Screw
15	1105-3003-000	Thermostat Setting Screw
16	1105-3151-000	Setting Screw Locknut
17	1105-3057-000	Bi-Metal Clamp Halothane
18	1105-3055-000	Bi-Metal Strip Halothane
19	1105-3058-000	Bi-Metal Clamp Enflurane, Isoflurane And Sevoflurane
20	1105-3054-000	Bi-Metal Strip Enflurane, Isoflurane And Sevoflurane
21	N122015	Clamp Securing Screw
22	1105-3004-000	Jewelled Bearing

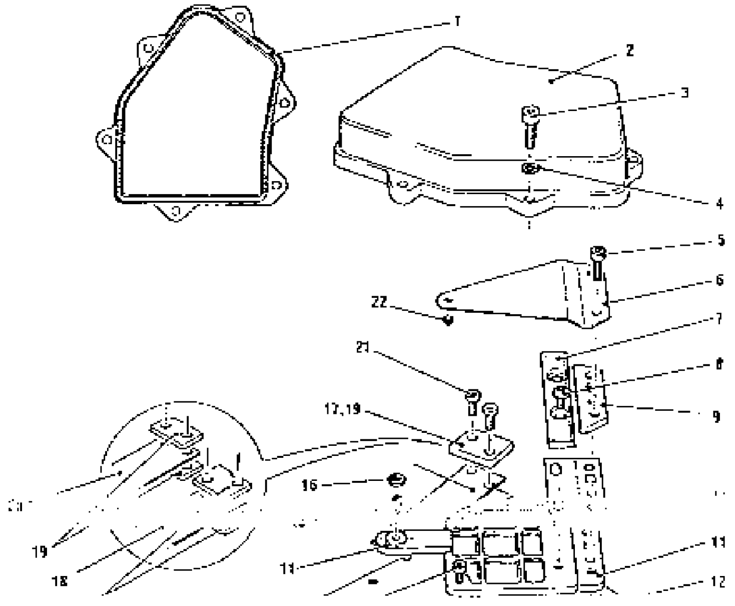


Fig. 10.13 Thermostat Assembly

10.16 Transfer Manifold Covers (Fig. 10.14)

Item No.	Part No.	Description
1	1105-3048-000	Short self adhesive strip
2	See Section 10.17	Vaporizer ID Label
3	1105-3109-000	Keyed Filler Outer Wrap
	1105-3108-000	Screw Filler Outer Wrap
4	N112104	Wrap Securing Screw

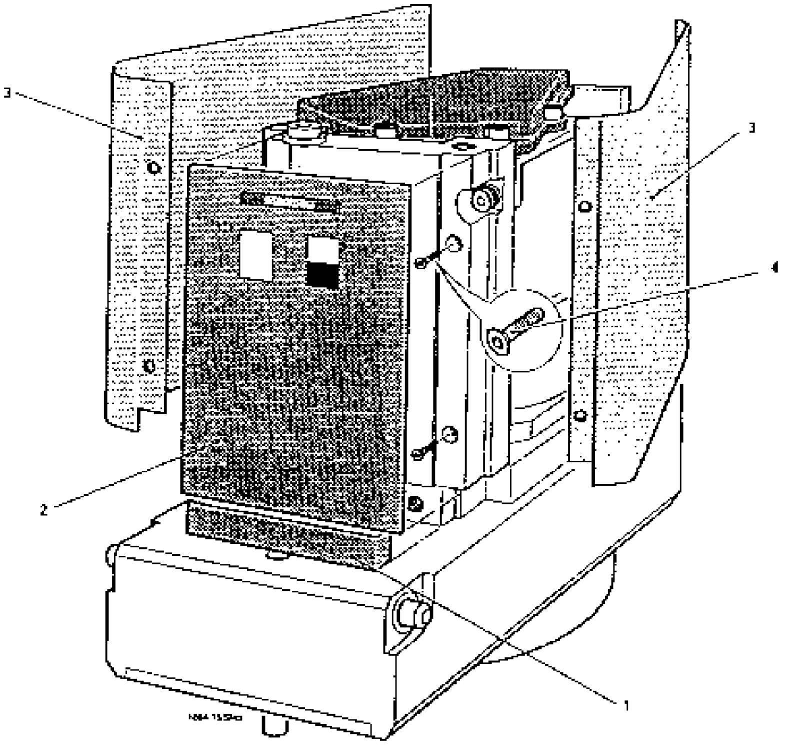


Fig. 10.14 Transfer Manifold Covers

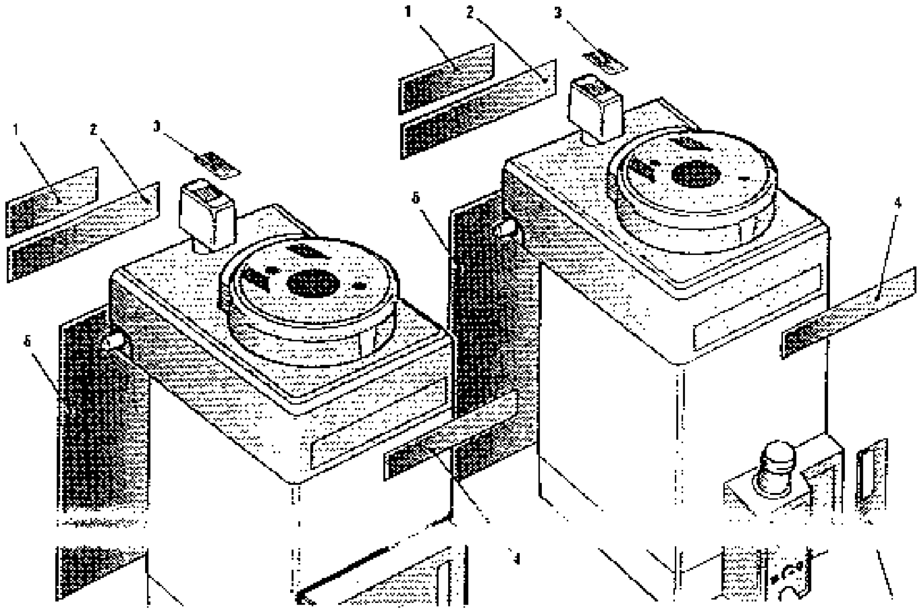
10.17 Labels, Dial Insert And Dial Strips

10.17.1 Common/Agent Specific Labels (Fig. 10.15)

(See Sect. 10.17.3 For Part Numbers)

Note: Labels are only available in kit form. Each kit contains all labels for one agent/language specific vaporizer. Individual labels are not available as separate items.

Item No.	Description
1	Serial No. Plate - Fluotec 5 Enfluratec 5 Isotec 5 Sevotec 5
2	Caution Label - USA And Canada Only USA Abbott Only
3	Locking Lever Cover
4	Front Label - Fluotec 5 Enfluratec 5 Isotec 5 Sevotec 5
5	Sight Glass Label
6	Vap I/D Label



10.17.2 Language/Agent Specific Labels (Fig. 10.16)

(See Sect. 10.17.3 For Part Numbers)

Item No.	Description
1	Top Plate Label
2	Dial Label
3	Filler Plug Label
4	Screw Filler Label
5	Keyed Filler Label

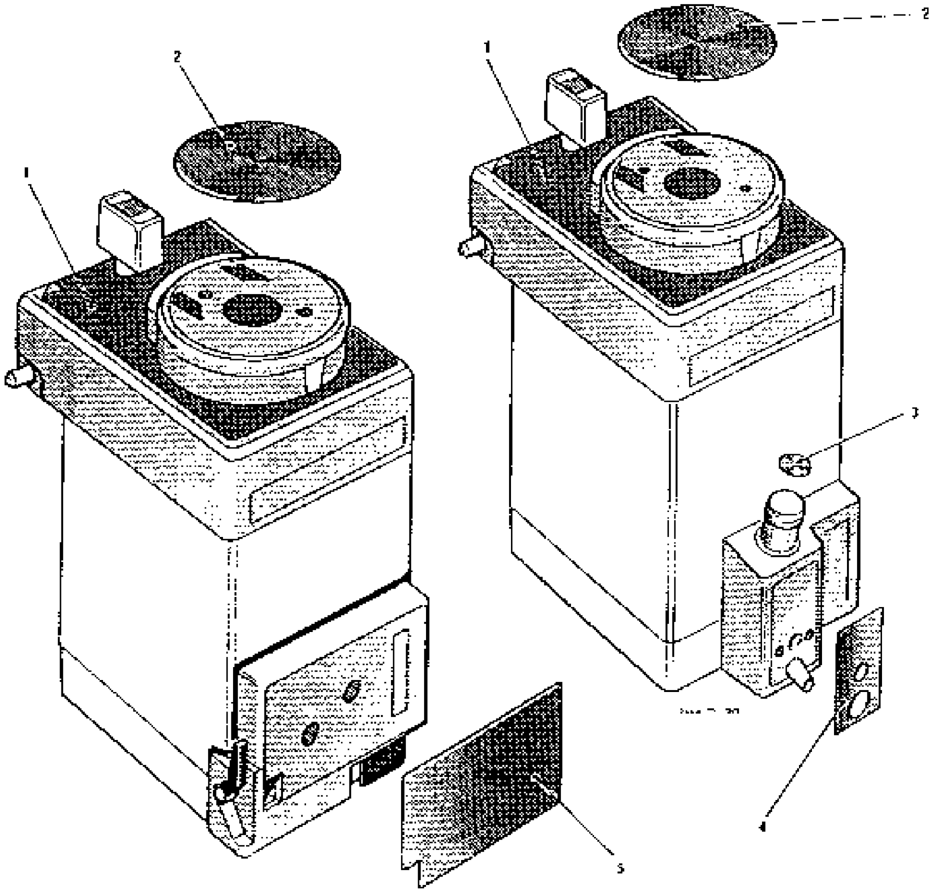


Fig. 10.16 Language/Agent Specific Labels

10.17.3 Label Kits

10.17.3.1 Halothane, Keyed Filler - English. Kit Part No. 1105-3484-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3381-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Fluotec	1105-3377-000	1
Vaporizer I/D Label	1105-3379-000	1
Keyed Filler Label	1105-3380-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.2 Halothane, Screw Filler - English. Kit Part No. 1105-3485-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3384-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Fluotec	1105-3377-000	1
Vaporizer I/D Label	1105-3379-000	1
Screw Filler Body Label - Halothane	1105-3382-000	1
Filler Plug Label	1105-3383-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1

10.17.3.3 Halothane, Keyed Filler - English (N.A.). Kit Part No. 1105-3486-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3386-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Fluotec	1105-3377-000	1
Vaporizer I/D Label	1105-3379-000	1
Keyed Filler Label	1105-3380-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1
Caution Label - Canada/USA	1105-3385-000	1

10.17.3.4 Halothane, Screw Filler - English (N.A.). Kit Part No. 1105-3485-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3387-000	[illegible]
Dial Label	[illegible]	[illegible]
Top Plate Label	1105-3376-000	1
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Cover Strip - Sump Cover	1105-3048-000	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

10.17.3.5 Halothane, Keyed Filler - French. Kit Part No. 1105-3488-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3392-000	1
Dial Label	1105-3389-000	1
Top Plate Label	1105-3388-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Fluotec	1105-3377-000	1
Vaporizer I/D Label	1105-3379-000	1
Keyed Filler Label	1105-3391-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1
Homologation Label	1105-3390-000	1

10.17.3.6 Halothane, Screw Filler - French. Kit Part No. 1105-3489-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3394-000	1
Dial Label	1105-3389-000	1
Top Plate Label	1105-3388-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Fluotec	1105-3377-000	1
Vaporizer I/D Label	1105-3379-000	1
Screw Filler Body Label - Halothane	1105-3393-000	1
Filler Plug Label	1105-3231-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1
Homologation Label	1105-3385-000	1

10.17.3.7 Halothane, Keyed Filler - Spanish. Kit Part No. 1105-3490-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3398-000	1
Dial Label	1105-3396-000	1
Top Plate Label	1105-3395-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Fluotec	1105-3377-000	1
Vaporizer I/D Label	1105-3379-000	1
Keyed Filler Label	1105-3397-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.8 Halothane, Screw Filler - Spanish. Kit Part No. 1105-3491-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3400-000	1
Dial Label	1105-3396-000	1
Top Plate Label	1105-3395-000	1
Locking Lever Label	1105-3059-000	1
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Filler Plug Label	1105-3231-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1

10.17.3.9 Halothane, Keyed Filler - Italian. Kit Part No. 1105-3492-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3404-000	1
Dial Label	1105-3402-000	1
Top Plate Label	1105-3401-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Fluotec	1105-3377-000	1
Vaporizer I/D Label	1105-3379-000	1
Keyed Filler Label	1105-3403-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.10 Halothane, Screw Filler - Italian. Kit Part No. 1105-3493-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3406-000	1
Dial Label	1105-3402-000	1
Top Plate Label	1105-3401-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Fluotec	1105-3377-000	1
Vaporizer I/D Label	1105-3379-000	1
Screw Filler Body Label - Halothane	1105-3405-000	1
Filler Plug Label	1105-3231-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1

10.17.3.11 Halothane, Keyed Filler - German. Kit Part No. 1105-3494-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3410-000	1
Dial Label	1105-3408-000	1
Top Plate Label	1105-3407-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Fluotec	1105-3377-000	1
Vaporizer I/D Label	1105-3379-000	1
Keyed Filler Label	1105-3409-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.12 Halothane, Screw Filler - German. Kit Part No. 1105-3495-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3412-000	1
Dial Label	1105-3408-000	1
Top Plate Label	1105-3407-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Fluotec	1105-3377-000	1
Vaporizer I/D Label	1105-3379-000	1
Screw Filler Body Label - Halothane	1105-3411-000	1

10.17.3.13 Halothane, Keyed Filler - Swedish. Kit Part No. 1105-3496-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3416-000	1
Dial Label	1105-3414-000	1
Top Plate Label	1105-3413-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Fluotec	1105-3377-000	1
Vaporizer I/D Label	1105-3379-000	1
Keyed Filler Label	1105-3415-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.14 Halothane, Screw Filler - Swedish. Kit Part No. 1105-3497-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3418-000	1
Dial Label	1105-3414-000	1
Top Plate Label	1105-3413-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Fluotec	1105-3377-000	1
Vaporizer I/D Label	1105-3379-000	1
Screw Filler Body Label - Halothane	1105-3417-000	1
Filler Plug Label	1105-3231-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1

10.17.3.15 Isoflurane, Keyed Filler - English. Kit Part No. 1105-3498-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3422-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Isotec	1105-3419-000	1
Vaporizer I/D Label	1105-3420-000	1
Keyed Filler Label	1105-3421-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.16 Isoflurane, Screw Filler - English. Kit Part No. 1105-3499-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3424-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Isotec	1105-3419-000	1
Vaporizer I/D Label	1105-3420-000	1
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1

10.17.3.17 Isoflurane, Keyed Filler - English (N.A.). Kit Part No. 1105-3500-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3425-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Isotec	1105-3419-000	1
Vaporizer I/D Label	1105-3420-000	1
Keyed Filler Label	1105-3421-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1
Caution Label - Canada/USA	1105-3385-000	1

10.17.3.18 Isoflurane, Screw Filler - English (N.A.). Kit Part No. 1105-3501-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3426-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Isotec	1105-3419-000	1
Vaporizer I/D Label	1105-3420-000	1
Screw Filler Body Label - Isoflurane	1105-3423-000	1
Filler Plug Label	1105-3383-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1
Caution Label - Canada/USA	1105-3385-000	1

10.17.3.19 Isoflurane, Keyed Filler - French. Kit Part No. 1105-3502-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3429-000	1
Dial Label	1105-3389-000	1
Top Plate Label	1105-3388-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Isotec	1105-3419-000	1
Vaporizer I/D Label	1105-3420-000	1
Keyed Filler Label	1105-3428-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1
Homologation Label	1105-3427-000	1

10.17.3.20 Isoflurane, Screw Filler - French. Kit Part No. 1105-3503-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3431-000	1
Dial Label	1105-3389-000	1
Top Plate Label	1105-3388-000	1
[illegible] Label	1105-3231-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1
[illegible] Label	1105-3427-000	[illegible]

10.17.3.21 Isoflurane, Keyed Filler - Spanish. Kit Part No. 1105-3504-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3433-000	1
Dial Label	1105-3396-000	1
Top Plate Label	1105-3395-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Isotec	1105-3419-000	1
Vaporizer I/D Label	1105-3420-000	1
Keyed Filler Label	1105-3432-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.22 Isoflurane, Screw Filler - Spanish. Kit Part No. 1105-3505-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3435-000	1
Dial Label	1105-3396-000	1
Top Plate Label	1105-3395-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Isotec	1105-3419-000	1
Vaporizer I/D Label	1105-3420-000	1
Screw Filler Body Label - Isoflurane	1105-3434-000	1
Filler Plug Label	1105-3231-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1

10.17.3.23 Isoflurane, Keyed Filler - Italian. Kit Part No. 1105-3506-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3437-000	1
Dial Label	1105-3402-000	1
Top Plate Label	1105-3401-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Isotec	1105-3419-000	1
Vaporizer I/D Label	1105-3420-000	1
Keyed Filler Label	1105-3436-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.24 Isoflurane, Screw Filler - Italian. Kit Part No. 1105-3507-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3439-000	1
Dial Label	1105-3402-000	1
Top Plate Label	1105-3401-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Isotec	1105-3419-000	1
Vaporizer I/D Label	1105-3420-000	1
Screw Filler Body Label	[illegible]	1
[illegible]	[illegible]	[illegible]
[illegible] Label	[illegible]-3060-000	1

10.17.3.25 Isoflurane, Keyed Filler - German. Kit Part No. 1105-3508-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3441-000	1
Dial Label	1105-3408-000	1
Top Plate Label	1105-3407-000	1
Locking Lever Label	1105 3059-000	1
Front Label - Isotec	1105-3419-000	1
Vaporizer I/D Label	1105-3420-000	1
Keyed Filler Label	1105-3440-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.26 Isoflurane, Screw Filler - German. Kit Part No. 1105-3509-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3443-000	1
Dial Label	1105-3408-000	1
Top Plate Label	1105-3407-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Isotec	1105-3419-000	1
Vaporizer I/D Label	1105-3420-000	1
Screw Filler Body Label - Isoflurane	1105-3442-000	1
Filler Plug Label	1105-3231-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1

10.17.3.27 Isoflurane, Keyed Filler - Swedish. Kit Part No. 1105-3510-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3445-000	1
Dial Label	1105-3414-000	1
Top Plate Label	1105-3413-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Isotec	1105-3419-000	1
Vaporizer I/D Label	1105-3420-000	1
Keyed Filler Label	1105-3444-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.28 Isoflurane, Screw Filler - Swedish. Kit Part No. 1105-3511-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3447-000	1
Dial Label	1105-3414-000	1
[illegible]	[illegible]	[illegible]
Locking Lever Label	1105-3059-000	1
Front Label - Fluotec	1105-3419-000	1
Vaporizer I/D Label	1105-3420-000	1

10.17.3.29 Enflurane, Keyed Filler - English. Kit Part No. 1105-3512-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3451-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Enfluratec	1105-3448-000	1
Vaporizer I/D Label	1105-3449-000	1
Keyed Filler Label	1105-3450-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.30 Enflurane, Screw Filler - English. Kit Part No. 1105-3513-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3453-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Enfluratec	1105-3448-000	1
Vaporizer I/D Label	1105-3449-000	1
Screw Filler Body Label - Enflurane	1105-3452-000	1
Filler Plug Label	1105-3383-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1

10.17.3.31 Enflurane, Keyed Filler - English (N.A.). Kit Part No. 1105-3514-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3454-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Enfluratec	1105-3448-000	1
Vaporizer I/D Label	1105-3449-000	1
Keyed Filler Label	1105-3450-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1
Caution Label - Canada/USA	1105-3385-000	1

10.17.3.32 Enflurane, Screw Filler - English (N.A.). Kit Part No. 1105-3515-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3455-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Enfluratec	1105-3448-000	1
[illegible]	[illegible]	1
Window Glass Label	1105-3060-000	1
Caution Label - Canada/USA	1105-3385-000	1

10.17.3.33 Enflurane, Keyed Filler - French. Kit Part No. 1105-3516-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3458-000	1
Dial Label	1105-3389-000	1
Top Plate Label	1105-3388-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Enfluratec	1105-3448-000	1
Vaporizer I/O Label	1105-3449-000	1
Keyed Filler Label	1105-3457-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1
Homologation Label	1105-3456-000	1

10.17.3.34 Enflurane, Screw Filler - French. Kit Part No. 1105-3517-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3460-000	1
Dial Label	1105-3389-000	1
Top Plate Label	1105-3388-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Enfluratec	1105-3448-000	1
Vaporizer I/O Label	1105-3449-000	1
Screw Filler Body Label - Enflurane	1105-3459-000	1
Filler Plug Label	1105-3231-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1
Homologation Label	1105-3456-000	1

10.17.3.35 Enflurane, Keyed Filler - Spanish. Kit Part No. 1105-3518-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3462-000	1
Dial Label	1105-3396-000	1
Top Plate Label	1105-3395-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Enfluratec	1105-3448-000	1
Vaporizer I/O Label	1105-3449-000	1
Keyed Filler Label	1105-3461-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.36 Enflurane, Screw Filler - Spanish. Kit Part No. 1105-3519-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3464-000	1
Dial Label	1105-3396-000	1
Top Plate Label	1105-3395-000	1
[illegible]	[illegible]	[illegible]
Cover Strip - Sump Cover	1105-3048-000	[illegible]
Window Glass Label	1105-3060-000	1

10.17.3.37 Enflurane, Keyed Filler - Italian. Kit Part No. 1105-3520-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3466-000	1
Dial Label	1105-3402-000	1
Top Plate Label	1105-3401-000	1
Locking Lever Label	1105 3059-000	1
Front Label - Enfluratec	1105-3448 000	1
Vaporizer I/D Label	1105-3449-000	1
Keyed Filler Label	1105-3465-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048 000	1

10.17.3.38 Enflurane, Screw Filler - Italian. Kit Part No. 1105-3521-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3468-000	1
Dial Label	1105-3402 000	1
Top Plate Label	1105-3401-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Enfluratec	1105-3448-000	1
Vaporizer I/D Label	1105-3449-000	1
Screw Filler Body Label - Enflurane	1105-3467-000	1
Filler Plug Label	1105-3231-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1

10.17.3.39 Enflurane, Keyed Filler - German. Kit Part No. 1105-3522-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3470-000	1
Dial Label	1105-3408-000	1
Top Plate Label	1105-3407-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Enfluratec	1105-3448-000	1
Vaporizer I/D Label	1105-3449-000	1
Keyed Filler Label	1105-3469-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.40 Enflurane, Screw Filler - German. Kit Part No. 1105-3523-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3472-000	1
Dial Label	1105-3408-000	1
Top Plate Label	1105-3407-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Enfluratec	1105-3448-000	1
Vaporizer I/D Label	1105-3449 000	1
[illegible]	[illegible]	[illegible]

10.17.3.41 Enflurane, Keyed Filler - Swedish. Kit Part No. 1105-3524-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3474-000	1
Dial Label	1105-3414-000	1
Top Plate Label	1105-3413-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Enfluratec	1105-3448-000	1
Vaporizer I/D Label	1105-3449-000	1
Keyed Filler Label	1105-3473-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.34 2 Enflurane, Screw Filler - Swedish. Kit Part No. 1105-3525-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3476-000	1
Dial Label	1105-3414-000	1
Top Plate Label	1105-3413-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Enfluratec	1105-3448-000	1
Vaporizer I/D Label	1105-3449-000	1
Screw Filler Body Label - Enflurane	1105-3475-000	1
Filler Plug Label	1105-3231-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1

10.17.3.43 Sevoflurane 5%, Keyed Filler - Japanese. Kit Part No. 1105-3526-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3480-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Sevotec	1105-3477-000	1
Vaporizer I/D Label	1105-3478-000	1
Keyed Filler Label	1105-3479-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1

10.17.3.44 Sevoflurane 5%, Screw Filler - English. Kit Part No. 1105-3527-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3482-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Sevotec	1105-3477-000	1
Vaporizer I/D Label	1105-3478-000	1

10.17.3.45 Sevoflurane 8%, Keyed Filler - English (N.A.). Kit Part No. 1105-3528-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3374-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Sevotec	1105-3477-000	1
Vaporizer I/D Label	1105-3478-000	1
Keyed Filler Label	1105-3479-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1
Caution Label	1105-3385-000	1

10.17.3.46 Sevoflurane 8%, Screw Filler - English (N.A.). Kit Part No. 1105-3529-000

Description	Part No.	Qty.
Product Label (Bar Coded)	1105-3375-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Sevotec	1105-3477-000	1
Vaporizer I/D Label	1105-3478-000	1
Screw Filler Body Label - Sevoflurane	1105-3481-000	1
Filler Plug Label	1105-3383-000	1
Cover Strip - Sump Cover	1105-3048-000	1
Window Glass Label	1105-3060-000	1
Caution Label	1105-3385-000	1

10.17.3.47 Sevoflurane 8%, Keyed Filler - Abbott (N.A.). Kit Part No. 1105-3532-000

Description	Part No.	Qty.
Product Label (Bar Coded) (Abbott)	1105-3530-000	1
Dial Label	1105-3378-000	1
Top Plate Label	1105-3376-000	1
Locking Lever Label	1105-3059-000	1
Front Label - Sevotec	1105-3477-000	1
Vaporizer I/D Label	1105-3478-000	1
Keyed Filler Label	1105-3479-000	1
Filler Plug Label	1105-3383-000	1
Clamp Screw Label	34033	1
Cover Strip - Sump Cover	1105-3048-000	1
Caution Label	1105-3531-000	1

10.17.4 Dial Insert And Dial Strips (Fig. 10.17)

Item No.	Description	Part No.
1	Dial Strip Common	1105-3157-000
2	Dial Strip H/I 0	1105-3155-000
	Dial Strip H/I -	1105-3160-000
	Dial Strip H/I +	1105-3161-000
	Dial Strip H/I 0 DOT	1105-3364-000
	Dial Strip H/I - DOT	1105-3365-000
	Dial Strip E 0/S 0	1105-3156-000
	Dial Strip E -/S-	1105-3162-000
	Dial Strip E +/S+	1105-3163-000
	Dial Strip Hal 4% H4 0	1105-3268-000
	Dial Strip Hal 4% H4 -	1105-3267-000
	Dial Strip Hal 4% H4 +	1105-3269-000
	Dial Strip Hal 4% H4 0 DOT	1105-3366-000
	Dial Strip Hal 4% H4 - DOT	1105-3367-000
	Dial Strip Sevo 8% - DOT	1105-3556-000
	Dial Strip Sevo 8% 0 DOT	1105-3557-000
	Dial Strip Sevo 8% + DOT	1105-3558-000
3	Dial Insert	1105-3166-000

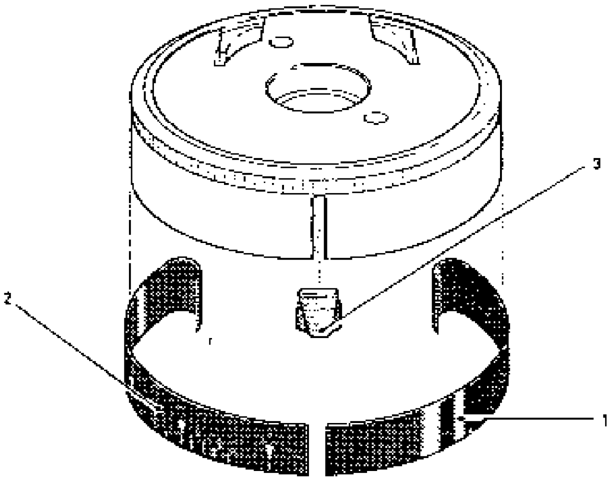


Fig. 10.17 Dial Insert And Dial Strips

10.18 Spares Kits Part No. List

Description	Spares Kit Part No.

Section 11.0

Test Sheets

Contents

Page

11.1 General 1

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11.1 General

The Test Sheets and Setting Sheet supplied within this section are for the use of Service Engineers when servicing Tec 5 Vaporizers. The sheets can be photocopied for future use as required.

The Test Sheets are referred to within the Service Centre Manual by quoting the following Test Sheet Numbers.

Sheet No.	Test/Setting Sheet	Section in which referred to:
1 of 4	Tec 5 Vaporizer Test Sheet	Section 3.0 - Servicing
2 of 4	Tec 5 Vaporizer Test Sheet	Section 5.0 - Calibration
3 of 4	Tec 5 Vaporizer Test Sheet	Section 4.0 - Accuracy Tests
4 of 4	Tec 5 Vaporizer Test Sheet Section 7.0 - Final Leak Test	Section 3.0 - Servicing
1 of 1	Tec 5 Vaporizer Thermostat Setting Sheet	Section 3.0 - Servicing

[illegible]

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THE BOC GROUP

Manufactured by
Ohmeda Station Road Steeton
West Yorkshire BD20 6RB

Tec 5 Continuous Flow Vaporizer
Service Centre Manual
Part No. 1105-0119-000
Issue 1
July 1995

OHMEDA
THE BOC GROUP

TEC 5 VAPORIZER TEST SHEET

Sheet 1 of 4 | Rev E

Vaporizer/Therm No.	Delete Inapplicable Types	Type of Vaporizer				Filler	
		Fluotec	Isotec	Enfluratec	Sevotec	Key	Screw

Test Specification 1105-0020-000

NOTES-

a) The numbers given at the left of the sheet refer to the relevant clause numbers of the Test Procedure.

b) Indicate PASS by inserting a ✓ in the appropriate box.
Indicate FAIL by inserting a ✗ in the appropriate box.

c) The permitted tolerance is given in brackets after the recorded value.

LEAK AND VENT TEST: TEST PROCEDURE No. 1105-0007-000

Remarks

Leak Test at ON (at 200 mmHg)

		Pass	Fail
1.4	Pressure Drop .... mmHg (≤4 mmHg)	☐	☐

Vent Test (at 150 mmHg)

		Pass	Fail
2.3	Indicated Pressure .... mmHg (≥120 mmHg)	☐	☐

Tested by | Date

RESISTANCE TEST: TEST PROCEDURE No. 1105-0008-000

		Pass	Fail
4.	A .... mmHg (≥32≤46 mmHg)	☐	☐
4.	B .... mmHg (≥32≤46 mmHg)	☐	☐
5.	C .... mmHg (≥32≤46 mmHg)	☐	☐
5.	A minus B .... mmHg (<4 mmHg)	☐	☐
	C minus B .... mmHg (<4 mmHg)	☐	☐

Tested by | Date

TACTILE TEST; TEST PROCEDURE No. 1105-0002-000

		Build Examination		Final Examination	
		Pass	Fail	Pass	Fail
1.	Interlock rods return to original position.	☐	☐	☐	☐
2.	Control dial will not rotate beyond OFF	☐	☐	☐	☐
2.	Stop button returns to original position.	☐	☐	☐	☐
3.	Locking lever returns to 'unlocked' position	☐	☐	☐	☐
4.	Control dial rotates freely	☐	☐	☐	☐
4.	Stop button and locking lever return to their original positions	☐	☐	☐	☐
		Tested by	Date	Tested by	Date

[illegible]

5. Amount of [illegible] liquid .... ml ([illegible] ± 20 ml)

Tested by | Date

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TEC 5 VAPORIZER TEST SHEET

Sheet 2 of 4 | Rev C

Vaporizer/Therm No.	Delete Inapplicable Types	Type of Vaporizer				Filler	
		Fluotec	Isotec	Enfluratec	Sevotec	Key	Screw

NOTES - The following abbreviations are used in the Calibration and Flow Tests -

T = Time of commencing test

R = Refractometer dial reading

D = Difference (R ± Zero Offset)

% = Actual percentage drug delivered

Zero = Zero Offset

R/C = Refractometer constant factor

l/min = Litres per minute

CALIBRATION @ 5l/min: TEST PROCEDURE 1105-0010-000

T	R	D	%	Dial Mark	Test Temp (°C)	Zero	Room Temp (°C)	R/C	Remarks
				0					
				0.2					
				0.4					
				0.6					
				0.8					
				1					
				2					
				3					
				4					
				5					

Delivered Percentage @ Dial Mark 1 = ...%

Deviation [illegible]

Overall Calibration result ☐ ☐

Tested by

Date

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Vaporizer/Therm No.	**TEC 5 VAPORIZER TEST SHEET**	Sheet 3 of 4	Rev C

T	R	D	%	Dial Mark	Calibration Result (%)	Test Temp (°C)	Zero	Room Temp (°C)	P/C	Remarks
FLOW TEST @ 15 l/min: TEST PROCEDURE 1105-0013-000										
				0.2						
				0.6						
				1						
				2						
				3						
				4						Test Result
				5						☐ Pass ☐ Fail
Tested by						Date				
FLOW TEST @ 1.0 l/min: TEST PROCEDURE 1105-0012-000										
				0.2						
				0.6						
				1						
				2						
				3						
				4						Test Result
				5						☐ Pass ☐ Fail
Tested by						Date				
FLOW TEST @ 0.2 l/min: TEST PROCEDURE 1105-0011-000										
				0.2						
				0.6						
				1						
				2						
				3						
				4						Test Result
				5						☐ Pass ☐ Fail
Tested by						Date				
ELEVATED TEMPERATURE TEST: TEST PROCEDURE 1105-0014-000										
				0.2						
				0.6						
				1						
				2						
				3						
				4						Test Result
				5						☐ Pass ☐ Fail
Tested by						Date				
FLOW TEST @ 10 l/min: TEST PROCEDURE 1105-0015-000										
				0.2						
				0.6						
				1						
				5						Test Result ☐ Pass ☐ Fail
Tested by						Date				

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TEC 5 VAPORIZER TEST SHEET

Sheet 4 of 4	Rev D

Vaporizer/Therm No.	Serial No.	Delete Inapplicable Types	Type of Vaporizer				Filler	
			Fluotec	Isotec	Enfluratec	Sevotec	Key	Screw

a) The numbers given at the left of the sheet refer to the relevant clause numbers of the Test Procedure.
b) Indicate PASS by inserting a ✓ in the appropriate box
Indicate FAIL by inserting a ✗ in the appropriate box.
c) The permitted tolerance is given in brackets after the recorded value.

FINAL LEAK CHECK: TEST PROCEDURE 1105-0016-000

Leak Test at OFF (at 300 mmHg)

1.4 Pressure Drop A..........................mmHg (≤5 mmHg) Pass ☐ Fail ☐

1.6 Pressure Drop B..........................mmHg (≤5 mmHg) Pass ☐ Fail ☐

Leak Test at ON (at 200 mmHg)

2.3 Pressure Drop ....mmHg (≤4 mmHg) Pass ☐ Fail ☐

Vent Test (at 150 mmHg)

3.3 Indicated Pressure ....mmHg (≥120 mmHg) Pass ☐ Fail ☐

Tested by Date

Remarks

TILT TEST: TEST PROCEDURE 1105-0017-000

3. No Load ....mm H_2O
4. Loaded at 6 o'clock position ....mm H_2O
5. Loaded at 9 o'clock position ....mm H_2O
5. Loaded at 12 o'clock position ....mm H_2O
5. Loaded at 3 o'clock position ....mm H_2O

TOLERANCE- The difference between the above minimum and maximum readings shall not exceed 5 mm H_2O

Tilt Test Result Pass ☐ Fail ☐

Tested by Date

Vaporizer dry-out procedure performed by ☐ (initials)

OVERALL TEST RESULT Pass ☐ Fail ☐

Product Examiner .... Date ....

TEC 5 VAPORIZER THERM SETTING SHEET

Sheet 1 of 1 | Rev E

Vaporizer/Therm No.	Serial No.	Delete inapplicable types	Type of Thermostat Halothane | Enflurane/Isoflurane Sevoflurane
Tests are carried out in accordance with:- Test Procedures 1105-0003-000 1105-0004-000 & 1105-0005-000 Therm Stop Screw Set @ .... mm H2O		Delete inapplicable case	Therm for rework — Name / Date Therm from failed vaporizer — Name / Date

Type of Test	Date	Temp (°C)	Reading (mmH2O)	Pass	Fail	Assy by Tested by	
Setting A							Initial Test
Setting B							
Stability: Push							
Stability: Pull							
Heat Cycle							
Setting C							
Setting D							
Setting A							Second Attempt
Setting B							
Stability: Push							
Stability: Pull							
Heat Cycle							
Setting C							
Setting D							
Setting A							Third Attempt
Setting B							
Stability: Push							
Stability: Pull							
Heat Cycle							
Setting C							
Setting D							
Setting A							d Attempt
Setting B							
Stability: Push							
Stability: Pull							
[illegible]							
[illegible]							
Setting D							

SECTION 12

REVISION: **0**

DATE: **21.06.00**

AUTHORISATION:-

CONTROLLED DOCUMENT

SECTION 12

REFERENCE CHARTS

DESCRIPTION	REF.	REV.	DATE
Room Temperature Tolerances(22°C)	AEQW-020	*A*	*21.06.00*

Authorisation:- Date:- 21.06.00

CONTROLLED DOCUMENT

SECTION 12

CIRCULATION LIST

REF.	COPY NO.	ISSUED TO	LOCATION	DATE
AEQW-020/A	1	A.COATES	TESTING DEPARTMENT	21.06.00
AEQW-020/A	2	A.COATES	DRYING-OUT/MAX TESTING	21.06.00
AEQW-020/A	3	A.COATES	OFFICE	21.06.00

Authorised:- Date:- 21.06.00

MK.5 VAPORIZERS

TOLERANCES FOR ROOM TEMPERATURE TESTS (19-23°C)

Table gives % v/v
Halothane, Enflurane and Isoflurane in Air

DIAL	MIN	MAX
0.0	0.00	0.08
0.2	0.10	0.30
0.6	0.50	0.70
1	0.90	1.10
2	1.80	2.20
3	2.70	3.30
4	3.60	4.40
5	4.50	5.50

COPY NO. 1 √
2
3

CONTROLLED DOCUMENT

AEQW-020/A
SHEET 1 OF 1
21.06.00

MK.5 VAPORIZERS

TOLERANCES FOR ROOM TEMPERATURE TESTS (19-23°C)

Table gives % v/v
Halothane, Enflurane and Isoflurane in Air

DIAL	MIN	MAX
0.0	0.00	0.08
0.2	0.10	0.30
0.6	0.50	0.70
1	0.90	1.10
2	1.80	2.20
3	2.70	3.30
4	3.60	4.40
5	4.50	5.50

COPY NO. 1
2
3

CONTROLLED DOCUMENT

AEQW-020/A
SHEET 1 OF 1
21.06.00

MK.5 VAPORIZERS

TOLERANCES FOR ROOM TEMPERATURE TESTS (19-23°C)

Table gives % v/v
Halothane, Enflurane and Isoflurane in Air

DIAL	MIN	MAX
0.0	0.00	0.08
0.2	0.10	0.30
0.6	0.50	0.70
1	0.90	1.10
2	1.80	2.20
3	2.70	3.30
4	3.60	4.40
5	4.50	5.50

COPY NO. 1
2
3 √

CONTROLLED DOCUMENT